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THE POPULATION OF THE EARLY POLISH CHRISTIAN CEMETERY IN GRODOWICE ON THE BASIS OF ARCHAEOLOGICAL, ANTHROPOLOGICAL, AND MOLECULAR RESEARCH

The aim of this study is to present a full characterization and catalogue of the graves of the early medieval inhumation necropolis that was recently found at the edge of the loess uplands in the western part of Małopolska (Lesser Poland) – specifically, in Grodowice, Kazimierza Wielka district. The second aim is to determine the matrilineal genetic structure and to present the first medieval population-level human DNA study from Małopolska.

The necropolis, which was excavated in 2005-2008 at site 1, is situated in an open field on the culmination of a broad, flat hill being part of a longitudinal range of hills separating the valleys of two larger rivers – namely, the Nidzica and Młyńska. The excavations resulted in the discovery of 35 inhumation graves, partly arranged in regular rows, dating to the early medieval period. The deceased were placed mostly in regular pits with their heads to the west. Very few traces of wooden coffins were recorded. 32 skeletons were classified in anthropological analysis. They present all age classes: *Infans/Juvenis* (13 graves), *Juvenis/Adultus* (8 graves, incl. 3 females and 3 males), *Adultus/Maturus* (9 graves, incl. 3 females and 3 males), and *Senilis* (1 grave). Various pathological changes and injuries were recorded: teeth plaque, enamel *hypoplasia*, caries, spine and long bone degenerations, *cribra orbitalia*, Schmorl's nodes. Thirteen mtDNA sequences were made which encompass almost the entire range of Western Eurasian macro-haplogroups.

Artefacts were recorded in 11 graves, such as: temple rings, coins, finger rings, beads, and coins. They occurred in female, male, and child graves alike.

The cemetery at Grodowice, like the majority of inhumation cemeteries in Małopolska, was probably founded in the second half or towards the end of the 10th century. Graves with coins indicate that it still functioned in the late 11th century. It cannot be ruled out that the Grodowice necropolis ceased to function as a result of the construction of churches in nearby Kazimierza Mała (probably as early as in the 11th century) and Bejsce (12th century or the first half of the 13th century).

KEY WORDS: inhumation graves, early medieval period, Małopolska (Lesser Poland), funeral rite

INTRODUCTION

The development of lands in the upper Vistula basin, which were the core of Małopolska (Lesser Poland) as formed during the early Middle Ages when the Polish state emerged, is reconstructed on the basis of two main categories of sources. Apart from the relatively scarce written sources, archaeological materials are also taken into consideration. The latter are characterized by a greater abundance and diversity than in the Slavic Tribal Period (6th-10th century; Poleski 2013). Our knowledge is significantly enhanced especially by sepulchral

finds, including the large amount of inhumation burial data that are at centre stage of at least two scientific disciplines – archaeology and physical anthropology. The latter uses a well-developed analytical apparatus, enriched with ancient DNA studies and various methods for examining the chemical composition of human remains.

Besides the origin of ancient human populations and migration routes, modern anthropology is also concerned with inter-population relations and their effect on the gene pool of populations. Those relations are difficult to evaluate with classical morphological methods. Thus, to estimate possible kinship relationships, along with more general questions of population affinity, DNA studies are especially useful.

Ancient DNA provides direct genetic evidence for past demographic events. Mitochondrial DNA from skeletal remains has been particularly successful in reconstructing the evolutionary history of European populations (Brandt *et al.* 2013; Bollognino *et al.* 2013; Rudbeck *et al.* 2005). While numerous ancient human DNA datasets from across Europe and to a lesser extend from the central and northern part of Poland (Juras *et al*. 2014; Kozłowski *et al.* 2014; Płoszaj *et al.* 2016; 2017) have been published, Małopolska remains to be investigated.

The aim of this study is to present the full characteristics along with a catalogue of the graves of an early medieval inhumation necropolis that was recently found on the margin of the loess uplands in the western part of Małopolska during excavations conducted at site 1 at Grodowice, Bejsce commune, in the Świętokrzyskie voivodeship (province). The second aim is to determine the matrilineal genetic structure and to present the first medieval population-level human DNA study from Małopolska by establishing mitochondrial DNA profiles for 13 individuals from the Grodowice cemetery. The scope of interdisciplinary research is extended by stable carbon and nitrogen isotope analysis of human bone and dentine collagen conducted for 14 adult individuals. Their results, which constitute an important contribution to reconstructing the local community's diet and its economy, will be presented in a separate paper[1].

SITE LOCATION

Site 1 is situated in an open field approx. 500 metres south-east of the centre of the village of Grodowice. The area is known as the "Argentyna" hamlet. Permanent and long-lasting agricultural exploitation resulted in deforestation, and thus the landscape has been radically transformed with respect to the type of vegetation. The archaeological site occupies the culmination of a broad, flat hill being part of a longitudinal range of hills separating the valleys of two larger rivers – namely, the Nidzica and the Młyńska (fig. 1). The hill is mostly made up of loess deposits, and rises more than 59 m above the bottom of the Młyńska valley, dominating the surrounding area. Its slopes are steep, and a more gentle approach can be found only from the north-east. The height difference within the area covered by the site is small, and does not exceed 2 metres.

Site 1 in Grodowice was discovered in April of 2005 during a surface survey conducted by Michał Grygiel from the Institute of Archaeology of the Jagiellonian University. The considerable devastation of the surface of the site by agricultural works was noticed, spurring the decision to launch rescue excavations in August of the same year. The excavations were led by Piotr Godlewski from the Institute of Archaeology of the Jagiellonian University, and were continued for four consecutive seasons (until 2008) in the summer months, during or after the harvest season. In 2006 Tomasz Herbich from the Warsaw branch of the Institute of Archaeology and Ethnology, Polish Academy of Sciences, carried out a geomagnetic survey of the site. The goal was to identify the borders of the site in more detail and the areas occupied by the most endangered necropolis of the Lusatian culture and the early medieval cemetery. The geomagnetic survey encompassed an area of 100 x 120 m around the archaeological trenches. The field stage of the archaeological research was financed from the resources of the Institute of Archaeology of the Jagiellonian University, with the financial support from the Provincial Heritage Protection Office in Kielce. A total area of approx. 600 m² was investigated by means of small trenches (fig. 2).

[1] Interdisciplinary research programme of materials from Grodowice was financed by the Ministry of Science and Higher Education in Poland (the *Diamond Grant*, project nr 0053/DIA/2012/41).

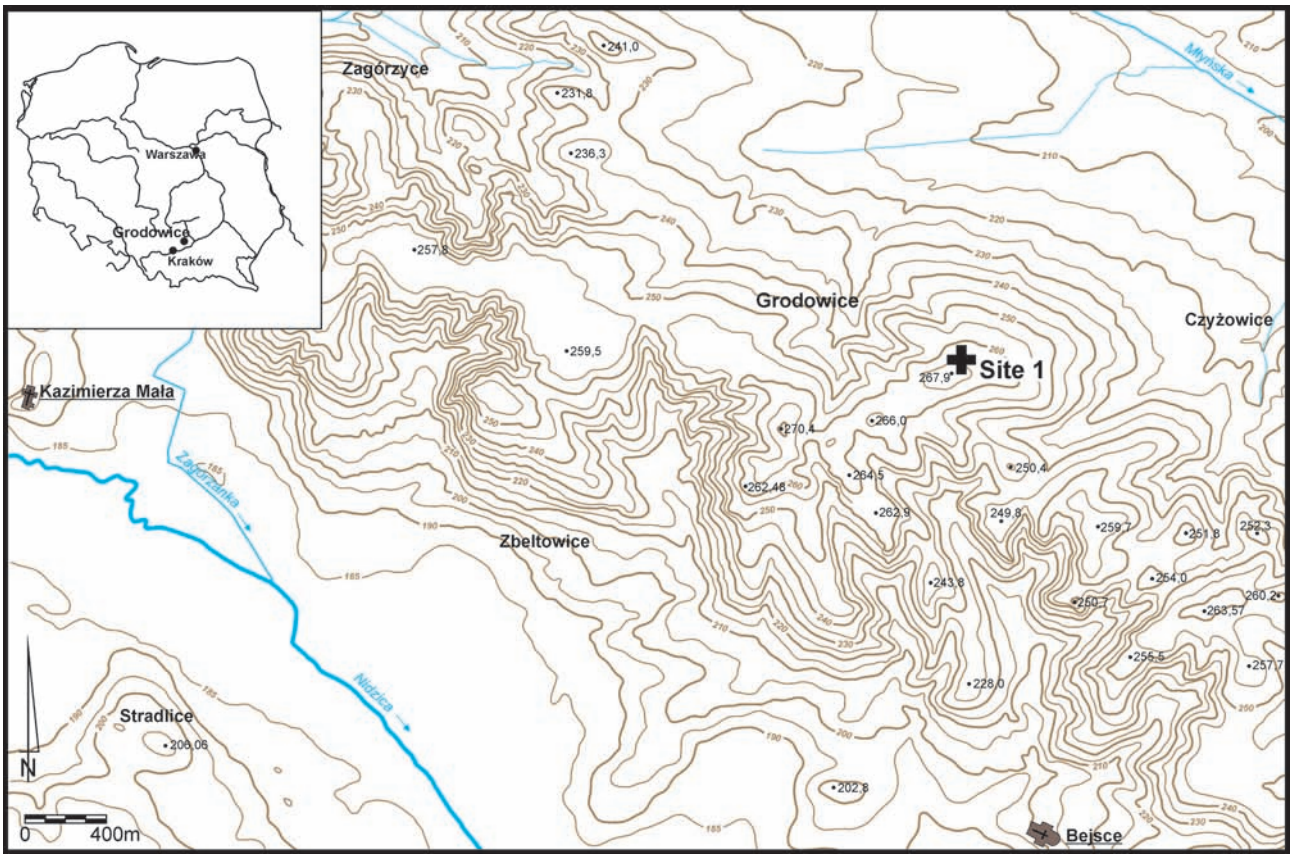

Fig. 1. Localization of site 1 at Grodowice (50°15'41.9"N, 20°35'41.12"E) and parish churches in Kazimierza Mała and Bejsce

THE CHARACTERISTICS OF THE BURIAL GROUND

The excavations resulted in the discovery of 35 graves dated to the early medieval period (fig. 3). One of them was explored only in part (no. 13). Nearly all of the graves had the form of inhumation burials placed within grave pits. In one case a pit containing no human bones was interpreted as a grave (no. 3) due to the fact that its shape and dimensions suggest it may have originally played the role of a grave pit. In the case of several other burials (nos. 38, 39, 41, 48, 75, 100) the outlines of the grave pit could not be identified. Most of the graves were discovered within trenches I, II, XVI, XVII, XVIII, XXI, XXII, and XXVII situated on the culmination of the hill where site 1 is located. They formed a cluster whose borders could only partially be identified during the fieldwork. The absence of graves in trenches III, IV, VII, X, and XIV suggests that the cluster does not continue to the west and south-east, while the northern border could not be identified. Within the cluster mentioned, burials were usually discovered close to each other. Older graves were never cut by younger ones. Only in the case of graves nos. 44 and 51, whose pits touched each other along the entire length, can a stratigraphic relationship be assumed. The arrangement of burials in this part of the site is very regular and can be regarded as roughly row arrangement. Approximately 10 m to the north-east of the cluster of graves, within trenches XXXVIII and XLII, close to the border of the explored area, another two early medieval burials were found (graves nos. 65 and 100). They may be isolated graves intentionally placed at the margins of the cemetery or, which is less likely, their discovery may suggest the existence of another, yet to be explored cluster of graves.

The vast majority of grave pits, i.e., as many as 26, were oriented along an east-west axis (nos. 2, 4, 5, 6, 9, 10, 12, 20, 23, 26, 27, 34, 35, 36, 38, 44, 46, 49, 50, 51, 52, 58, 59, 102, 103, 104). In three cases (nos. 39, 75, 100) the grave pits had a N-S orientation. Another pit (no. 65), in the north-eastern part

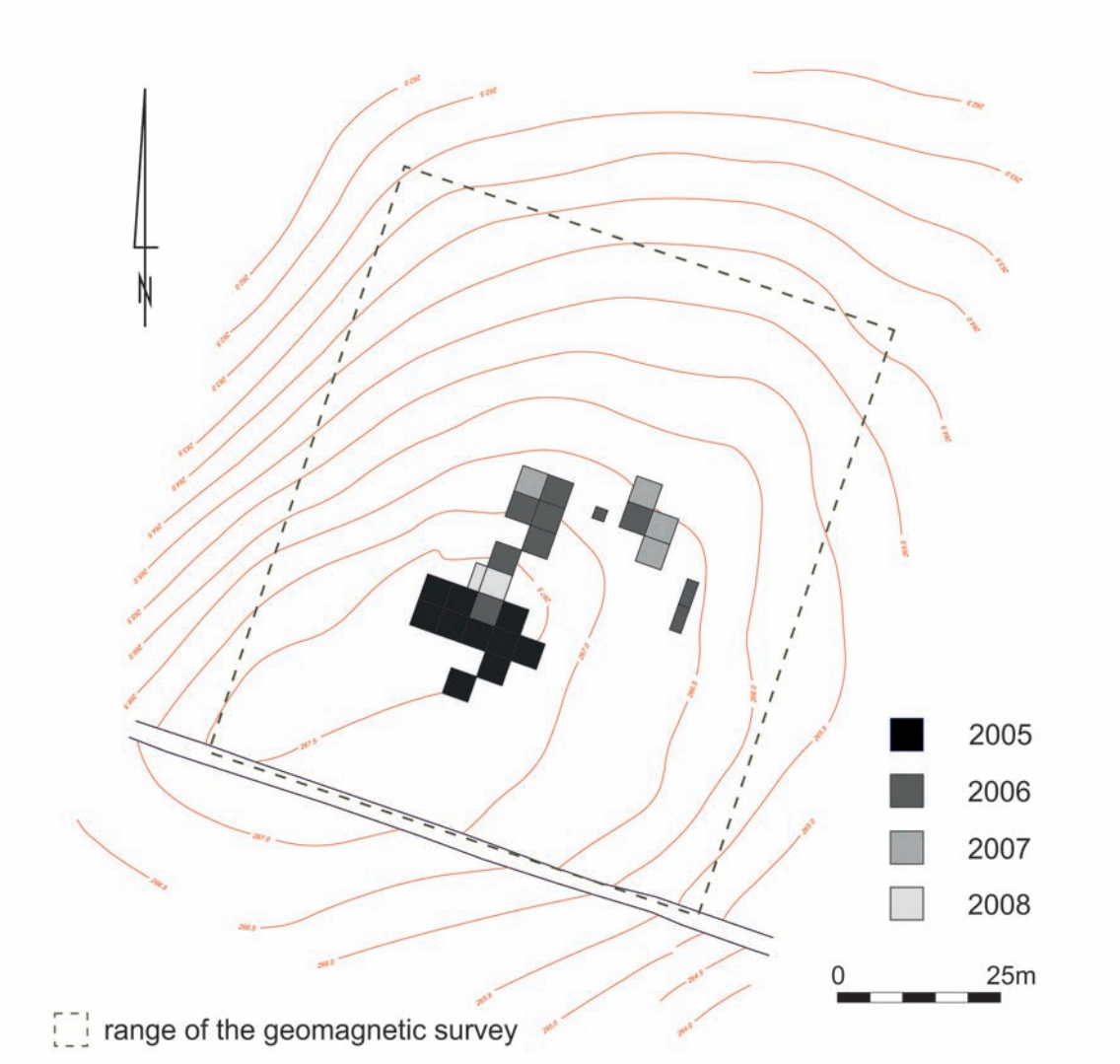

Fig. 2. Range of archaeological investigations at site 1 in Grodowice in 2005-2008

of the cemetery, was the only one oriented along a NE-SW axis. In six graves (nos. 38, 39, 41, 48, 75, 100) the outlines of grave pits were illegible. This may perhaps stem from the very poor state of the grave preservation. Grave pits were usually rectangular in plan, with rounded corners (fig. 4). In a few cases the pit resembled an oval (graves nos. 3, 9, 27, 58). The cross-sections of the grave pits were not recorded during the exploration. In many cases such observations were hampered or even impossible due to the fact that early medieval burials were dug into the fills of earlier, prehistoric features. In graves where the shape of the pit in cross section could be identified, the pits resembled a trough with steep walls, and skeletons were placed directly on the flat bottom.

In the majority of cases the size of the grave pit was adjusted to the size of the body buried there, so that adult individuals were buried in larger pits. Pits were the smallest in child burials. However, this rule was not always observed. Four child graves were found (nos. 5, 12, 23, 46) buried in pits whose size was much larger than needed. The length of grave pits varied between 90 and 274 cm. The same applies to the pit width. The smallest pits were only 54 cm wide (no. 34), while the largest reached 130 cm (grave no. 3). The depth of the grave pits (calculated from the present day ground surface) varied within the cemetery. No regularity was noticed in the distribution of graves sharing similar depth. It should only be noted that most of the shallow burials were found close to the hilltop, so their lesser depth may stem from the fact that this was the zone most exposed to damage by the erosion, rather than be the result of a deliberate decision of the people using the cemetery.

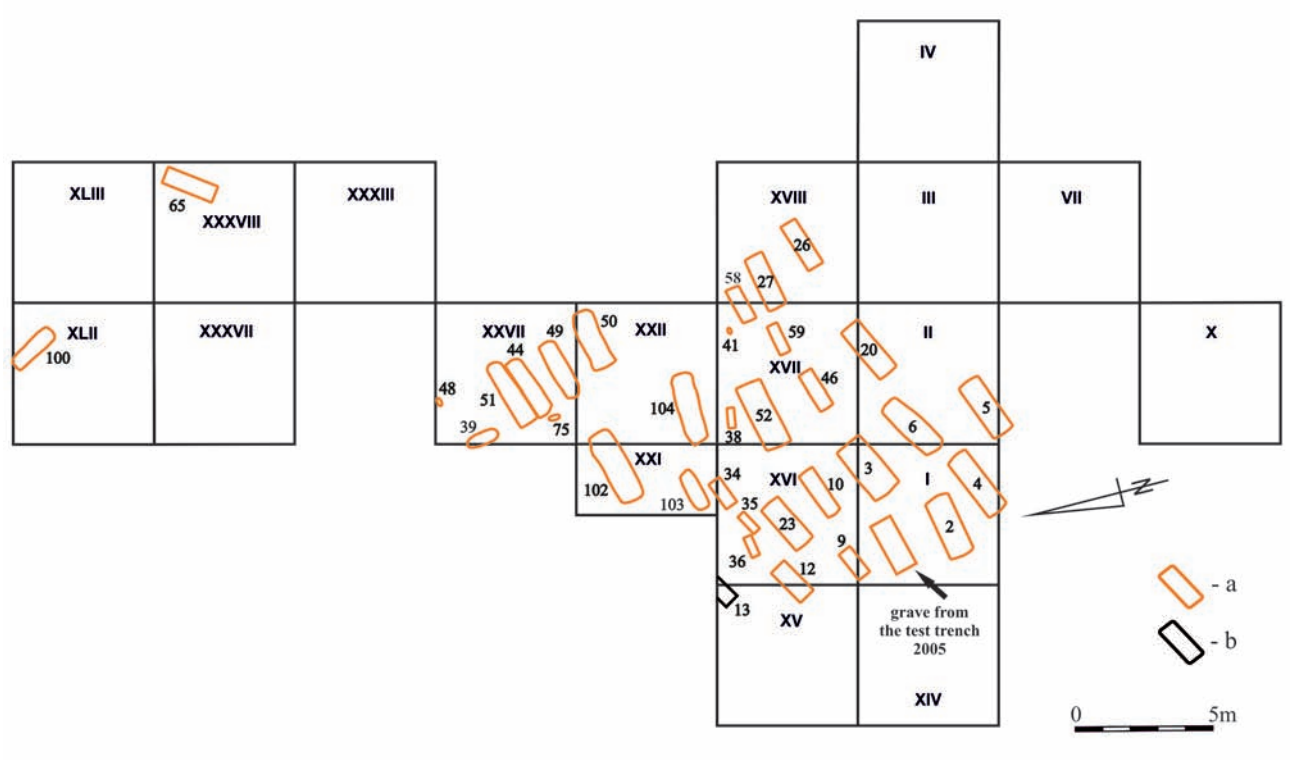

Fig. 3. Grodowice, site 1. Plan of the early medieval cemetery: a – early medieval graves; b – unexplored graves

The vast majority of graves (20 of the 34 explored) was discovered immediately beneath the topsoil, at a depth of 20-30 cm from the present day ground surface (nos. 2, 3, 4, 5, 6, 9, 10, 12, 20, 23, 26, test trench 2005). The analysis of the depth at which the bottoms of the grave pits were recorded allowed for three groups of grave to be distinguished:

- I – graves in which the bottom is found no deeper than 40 cm from the present day ground surface. To this group belong 13 graves (nos. 2, 3, 5, 9, 12, 35, 36, 41, 46, 48, 100, 104, test trench 2005).
- II – graves in which the bottom is found between 40 and 80 cm from the present day ground surface. To this group belong 15 graves (nos. 4, 6, 10, 20, 23, 34, 38, 39, 49, 50, 51, 58, 65, 75, 103).
- III – graves in which the bottom is found deeper than 80 cm from the present day ground surface. To this group belong six graves (nos. 26, 27, 44, 52 59, 102).

The depth at which the deceased were buried showed no correlation with their age.

Grave pits had diversified fills. Homogenous fills, containing humus soil of a light- or dark-brown colour, were clearly predominant (23 graves). Non-homogenous fills were also recorded, in which humus soil was mixed with lumps of loess. In grave no. 6 the non-homogenous character of the fill stemmed from the activity of burrowing animals. In the case of six graves (nos. 38, 39, 41, 48, 75, 100) the lack of identifiable pit outlines made it impossible to determine the character of the fill.

The majority of graves revealed no traces of constructions made of organic materials. Such constructions were recorded in only four cases (fig. 5). In graves nos. 2, 10, 27, 52 the outlines of what most likely were wooden coffins were identified. Three of these graves belonged to females (nos. 10, 27, 52), and one to a male (no. 2). The same interpretation possibly holds true for a regular, rectangular layer of dark-brown soil recorded in grave 10A, which became noticeable in the lower part of the pit, around the bones of the skeleton. None of these graves yielded metal elements joining the sides of the alleged coffins.

The state of preservation of particular skeletons differed greatly. Although the loess bedrock favours the preservation of bones (graves nos. 4, 6, 20, 26, 27, 36, 44, 49, 50, 58, 59, 102, 103, 104), they have not been well-preserved throughout. Many of them, in particular the more shallow ones, were disturbed by intensive agriculture (graves nos. 9, 10, 23, 46,

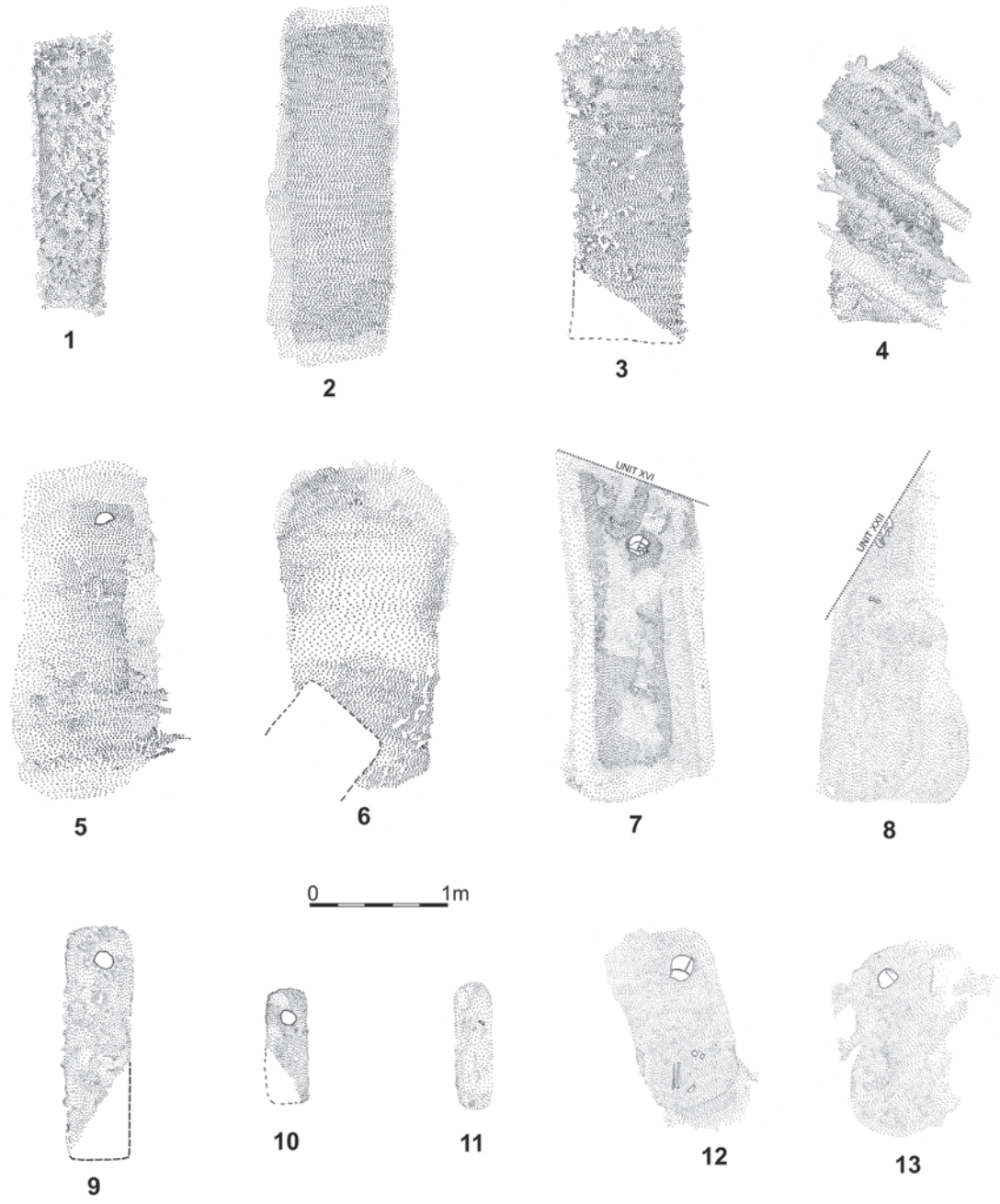

Fig. 4. Grodowice, site 1. Examples of various shapes of burial pits: 1 – grave 10; 2 – grave 4; 3 – grave 5; 4 – grave 12; 5 – grave 2; 6 – grave 3; 7 – grave 52; 8 – grave 49; 9 – grave 34; 10 – grave 35; 11 – grave 36; 12 – grave 58; 13 – grave 59

48, test trench 2005). This included not only the translocation or damage to a considerable part of a skeleton by ploughing, but also the decomposition of bones due to the operation of chemical compounds penetrating to the natural bedrock from the topsoil (graves nos. 5, 35, 38, 39, 41, 52, 65, 75, 100). The state of the preservation of bones was also affected by diagenetic processes. However, the general state of preservation of the analysed material can be described as good.

For the majority of graves the original position of the deceased was possible to fully identify. In burials where the remains were preserved poorly or their original arrangement underwent significant transformation, the position of the body could only partly be reconstructed (graves nos. 12, 23, 38, 52,

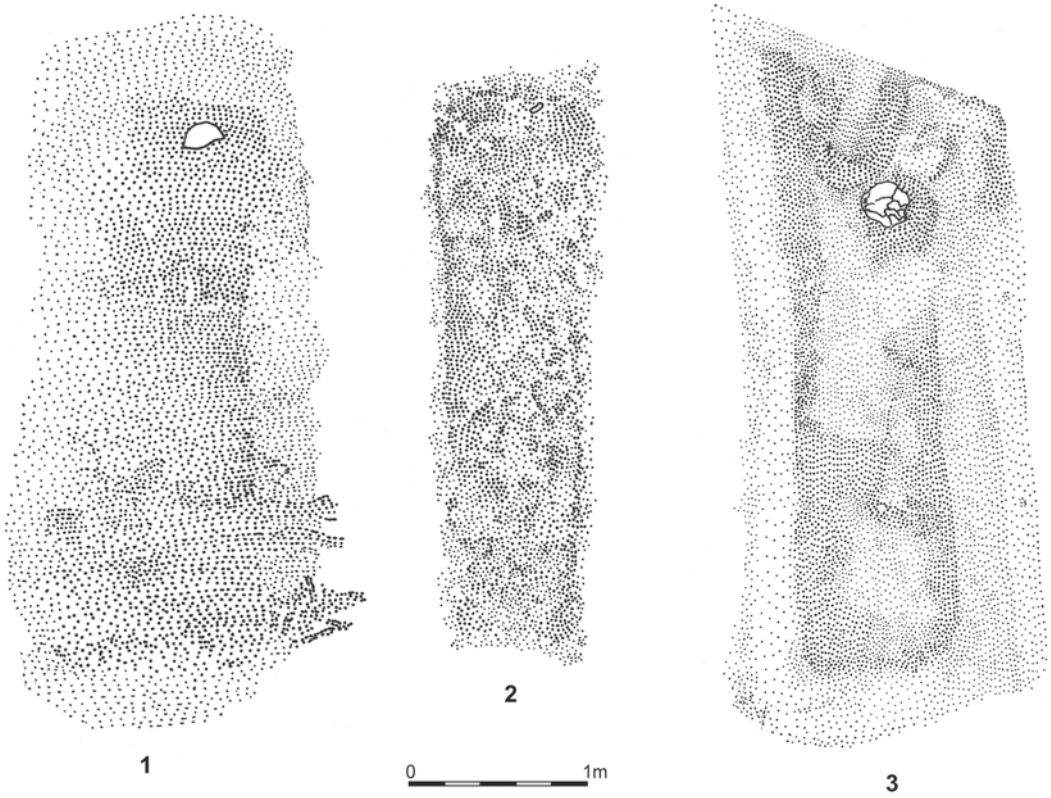

Fig. 5. Grodowice, site 1. Examples of burials with the remnants of wooden structures:
1 – grave 2; 2 – grave 10; 3 – grave 52

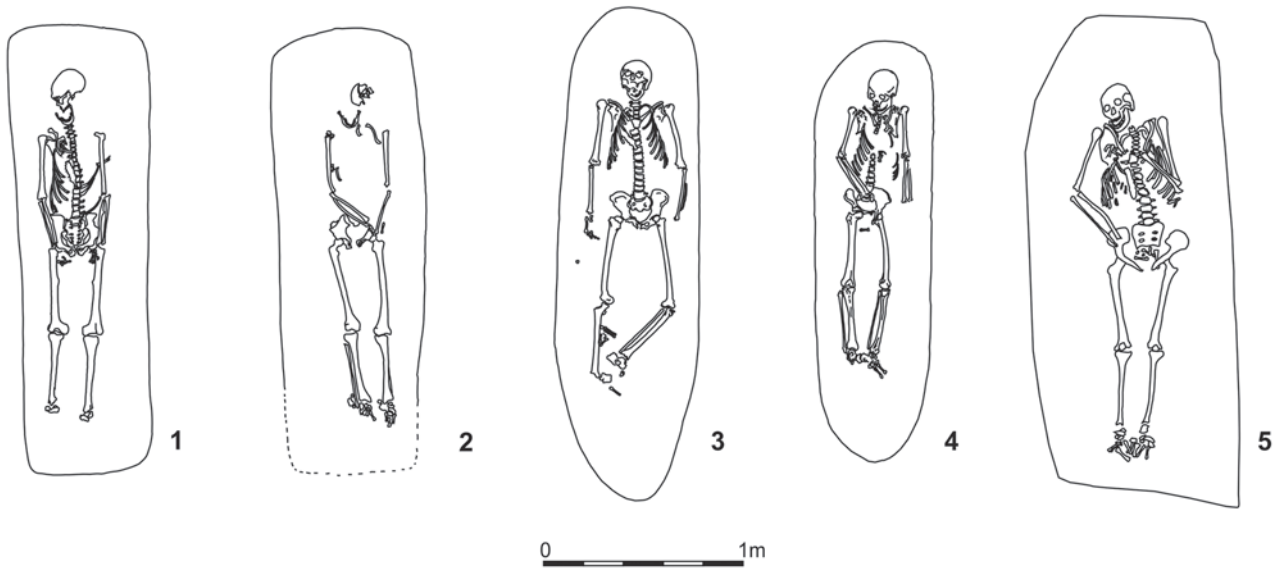

Fig. 6. Grodowice, site 1. Examples of the position of the body in grave:
1 – grave 4; 2 – grave 5; 3 – grave 20; 4 – grave 27; 5 – grave 102

65, test trench 2005). The very poor state of skeleton preservation made such analysis impossible for five graves (nos. 9, 39, 41, 48, 75). The most widespread manner of body deposition was in a supine position with the arms stretched along the body (graves nos. 2, 4, 6, 10, 20, 26, 34, 35, 36, 44, 46, 49, 51, 58, 59, 100, 103, 32). The hands were sometimes placed on the pelvis, which was recorded in five cases. In four

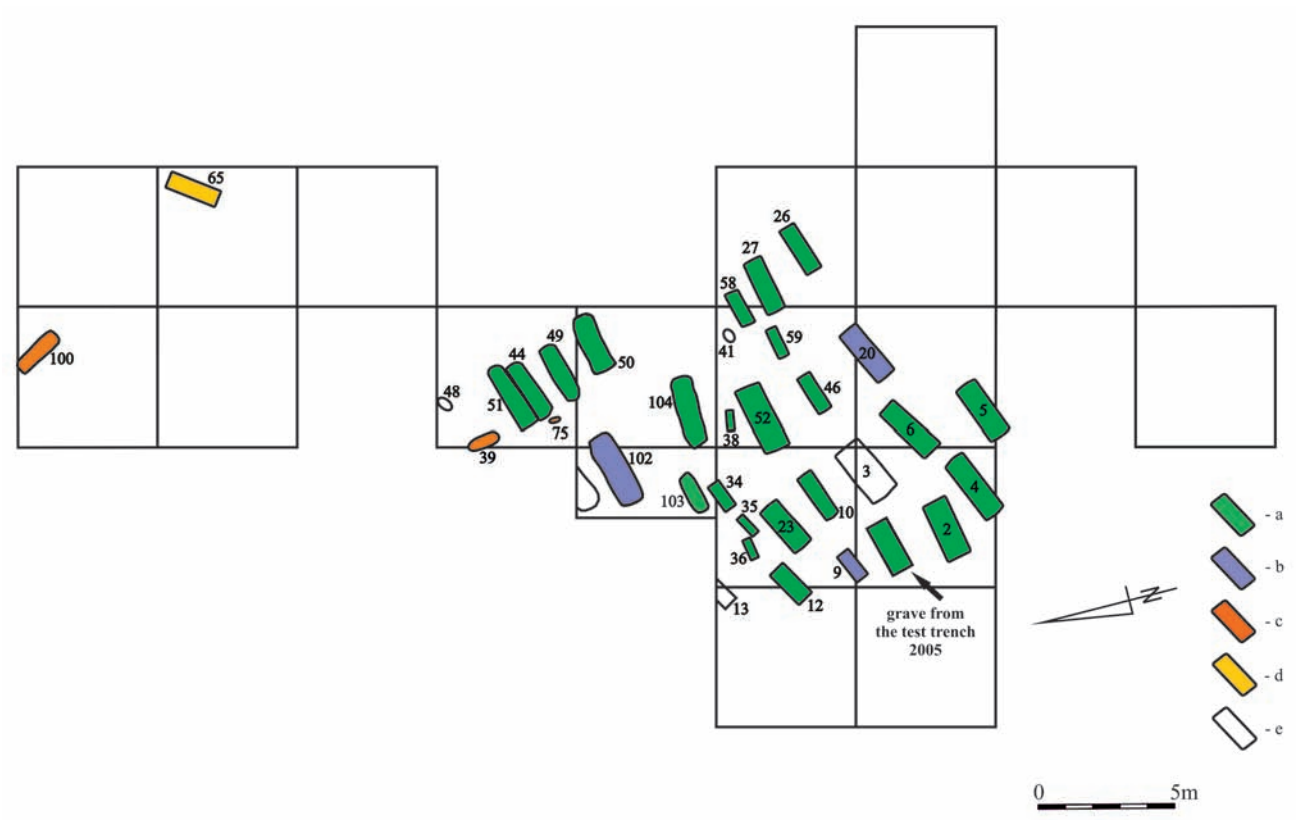

Fig. 7. Grodowice, site 1. Plan of the cemetery and the orientation of the deceased:
a – to the west; b – to the east; c – to the south; d – to the north-east; e – undetermined

graves the deceased had his right hand on the pelvis (graves nos. 27, 50, 102, 104), and in one grave both hands were put on the left hip (grave no. 5). The individual buried in grave no. 102 had the left hand bent at the elbow and placed on the chest. The position of legs was usually natural, straight, and only the individual buried in grave 20 had the left leg slightly bent at the knee (fig. 6).

The orientation could not be established for only two graves, and this was due to the poor preservation of the skeletons (graves nos. 41, 48). Among the remaining burials, the orientation along an east-west axis was clearly predominant (fig. 7). In 24 burials the deceased were placed in the grave with their heads to the west. To this group belong female (six graves; nos.: 10, 27, 44, 50, 51, 52), male (six graves; nos. 2, 4, 6, 26, 49, 104), and child burials alike (11 graves; nos. 5, 12, 23, 34, 35, 36, 38, 46, 58, 59, 103). In the case of the individual discovered in the test trench from 2005, who also shared the orientation with the head to the west, sex was not anthropologically determined. Only in three graves (nos. 9, 20, 102) were the deceased buried with the head to the east. Here belong two males (nos. 20 and 102) and a female (no. 9). The N-S orientation with the head to the south was recorded in three burials (nos. 39, 75, 100). One of them (no. 75) held the skeleton of a child aged *Infans I*, the second one (no. 100) belonged to an adult male, and the last (no. 39) to an individual of undetermined sex, aged *Senilis.* The grave designated as no. 65, situated in the north-eastern part of the cemetery, was the only one oriented along a NE-SW axis. It held the remains of an individual of undetermined sex, aged *Adultus/Maturus,* with their head turned towards the south-west.

ANTHROPOLOGICAL ANALYSIS

Anthropological analysis was carried out for 32 skeletons. A total of five main age categories were identified in the analyzed material (*Infans, Juvenis, Adultus, Maturus, Senilis*). If the estimation of age markers gave ambiguous results, the skeleton was classified as belonging to a transitory group. One

individual was described broadly as an "adult" due to the poor preservation of the skeleton and the lack of diagnostic traits. To the category of *Infans I* were ascribed nine skeletons (graves nos. 34, 35, 36, 38, 41, 46, 48, 59, 75). To *Infans I/Infans II* two skeletons were assigned (graves nos. 58, 103). To the category of *InfansII/Juvenis* belong two skeletons (graves nos. 12, 23). The category of *Juvenis/Adultus* is represented by one skeleton from grave no. 5. The *Adultus* category includes seven skeletons (nos. 6, 9, 10, 20, 44, 49, 51) of which three belonged to males (nos. 6, 20, 49) and three to females (nos. 10, 44, 51). In the case of the individual from grave no. 9 the sex was determined as probably female. To the category of *Adultus/Maturus* were classed five skeletons (graves nos. 2, 4, 50, 52, 65), of which two were males (nos. 2, 4), two females (nos. 50 and 52), and one belonged to the individual of undetermined sex buried in grave no. 65. The *Maturus* category grouped four skeletons (graves nos. 26, 27, 102, 104) of which three belonged to males (graves nos. 26, 102, 104), and one to a female (no. 27). To the age category *Senilis* only one skeleton was assigned, originating from grave no. 39 and belonging to an individual of undetermined sex. Additionally, and beyond the scope of the commonly used age categories, a separate category was created for the male skeleton from grave no. 100, who was only generally described as an adult. In this case the attribution to standard age categories proved impossible due to the lack of diagnostic traits.

The analyzed series of skeletons revealed the presence of various pathological changes and injuries. A common change observed on teeth was plaque, which was recorded in 53.33% of individuals. Another frequent (36.66%) oral pathology was enamel *hypoplasia*, which is a pathology of the teeth resulting from defective enamel formation, and which is one of the markers of physiological pressure or childhood injuries. The enamel deficiency can form only during the development of teeth and leaves a permanent mark in further life (Roberts, Manchester 2005). Metabolic pressure, induced e.g. by malnutrition, is one of the most popular causes of enamel *hypoplasia* (Lucacs 1989; Skinner, Goodmann 1992). This suggests that the analyzed population lived in difficult environmental conditions (a deficiency of nutrients in food, malnutrition).

Another relatively common pathology was caries (26.66% of all individuals). The considerable proportion (25%) of spine and long bone degenerations is indicative of hard physical labour. The analysis of body height performed on 13 individuals with three different methods showed strong sexual dimorphism. The average height calculated with Pearson's method was 153.75 cm for females and 165.66 cm for males.

The occurrence in one individual (female aged *Adultus/Maturus,* grave 50) of *cribra orbitalia,* i.e., porotic hyperostosis, might have been caused by a number of factors, the most important of which include: anaemia, genetic-related causes, cachexia caused by contagious disease, or iron deficiency (Haduch 1997, 93-94). The latter may result from the excessive consumption of dairy products and carbohydrates in relation to the meat of vertebrate animals, infection with parasites, or incorrect absorption of iron from the alimentary canal (El-Najjar *et al.*, 1967). Skeletal changes of the *cribra orbitalia* type are pathological markers of physiological stress suffered during the ontogenesis process (Piontek 1992). Also, Bergmann's research indicates the possible correlation between the incidence of *cribra orbitalia* and the level of economic development, social stratification, or living conditions (Bergman 1986). On the other hand, if we assess social status based on the number of artefacts in grave inventory, then this postulated correlation cannot be confirmed in Grodowice. *Cribra orbitalia* forms most often in early infancy (Walker *et al.* 2009, 5).

Attention must also be given to another two graves. In the case of the male of the *Adultus* age buried in grave 20, healed, symmetrical fractures of the shafts of his ulnar bones were identified Such fractures prove that he must have suffered from a traumatic experience in his lifetime. In grave 102, belonging to a male of *Maturus* age, Schmorl's nodes were observed on the body of the vertebrae. This pathological condition may have various causes. Schmorl's nodes may form due to inborn spinal cord defects (Scheuermann's kyphosis), traumas, but also due to ageing (Faccia, Williams 2008). In adults, Schmorl's nodes typically can develop as a result of degenerative diseases of intervertebral cartilage, while among young individuals they are most often the consequence of trauma caused by falling from a great height, lifting excessive weight, or physical exercise (Mann, Murphy 1990).

MTDNA ANALYSIS OF SELECTED HUMAN BONES

Thirteen mtDNA sequences spanned the range of np 16053-16420. The medieval sequences encompass almost the entire range of western Eurasian macro-haplogroups: H, J, U. In case of few individuals (G2 and G4; G44 and G51) identical haplotypes, which belong to haplogroups U5a1 and J2a1a1, respectively were detected. Interestingly, there is one sample which belongs to the Asian haplogroup G. The relatively high presence of G2a was detected by Buryats from Russia (Derenko *et al.* 2013; 2018), Kazakhs (Comas *et al.* 2004; Gokcumen *et al.* 2008; Irwin *et al.* 2010), Kyrgyz (Comas *et al.* 1998; Irwin *et al.* 2010), populations from China (Yao *et al.* 2000; 2002a; 2002b; 2003; 2004; Qian *et al.* 2001; Oota *et al.* 2002; Kong *et al.* 2003; Wen *et al.* 2004; Li *et al.* 2007; Liu *et al.* 2011), Japanese (Horai *et al.* 1996; Imaizumi *et al*. 2002; Maruyama *et al.* 2003; Tajima *et al.* 2004; Tanaka *et al.* 2004; Mabuchi *et al.* 2007), Koreans (Lee *et al.* 2006; Derenko *et al.* 2007; Lee *et al.* 2006), Khants and Mansi (Derbeneva *et al.* 2002; Pimenoff *et al.* 2008) and Yakuts (Derenko *et al.* 2007; Fedorova *et al.* 2003; Pakendorf *et al.* 2003; 2006; Puzyrev 2003). The presence of a haplotype which belongs to the haplogroup G resulted in an Asian-European character of the investigated population based on population genetic analysis. As archaeological data indicates, the Middle Ages were a period when Asian populations, including Altaic tribes (Huns, Avars, and Mongols) were engaged in wars on the European continent (Curta 2001). The consequence of this may be traces of Asian haplotypes in European populations. The presence of clade G2a in Polish populations could further reflect the influx of Asian haplotypes during the medieval wars in which Altaic tribes were engaged (Miernik-Sikorska *et al.* 2013, 7). Multidimensional scaling (MDS) as well as shared haplotype analysis (SHA) showed that the investigated population is relatively near to the medieval population from the Contact-Zone from Slovakia and Croatia (Csákyová *et al.* 2016; Csősz *et al.* 2016)[2].

[2] For more information on the genetic structure of this population see: Kubica-Grygiel, Csáky, Mende 2019 in this volume.

CATEGORIES OF GRAVE EQUIPMENT

Artefacts were recorded in 11 graves, which is 32% of all the burials. They occurred in female, male, and child graves alike. The discovered artefacts can be divided into six categories, of which the first four encompass the elements most commonplace in early medieval cemeteries, such as: temple rings, coins, finger rings, and beads.

The most numerous type of artefact were temple rings, with as many as 13 specimens discovered in eight graves (fig. 8; table 1). Six of the latter were female graves (nos. 9, 10, 23, 44, 50, 52), one held the remains of an individual aged *Infans I/Infans II* (no. 103), and one temple ring originated from the burial discovered in the test trench opened in 2005. The vast majority of the temple rings were made of silver (grave 9, 23, 52, test trench; fig. 8:3.6.9.13; 15:T/1, 18:9/1, 21:1, 31:1) or brass (grave 50, 103; fig. 8:2.4.5.11.12, 29:1-3, 34:1.2). Only a few specimens were made of copper or copper alloy (grave 10, 44, 50; fig. 8:7.8.10, 19:1, 24:2, 29:4) and one ring was made of lead (grave 44; fig. 8:1, 24:1). The state of temple rings' preservation can be assessed as very good. Ring sizes vary and range from 10 to 15 mm (inner diameter). All the discovered specimens can be attributed to type III acc. to K. Musianowicz, known as S-shaped temple rings. Three rings, originating from graves nos. 9, 52 and from the 2005 test trench belong to type IIIc acc. to K. Musianowicz, being a variant of S-shaped rings. Temple rings of this type are decorated with parallel grooves on the outer side of the loop (fig. 8:3.9.13). With respect of the inner diameter, all the discovered artefacts represent variant A acc. to Kóčka-Krenz (Kóčka-Krenz 1971, 47), which groups temple rings whose inner diameter does not exceed 2.0 cm. Rings of this type started to occur generally in the 10th century, especially its second half, and remained in use till the second half of the 13th century. They occurred throughout the whole of north-western Slavdom, with concentrations in Wielkopolska (Greater Poland), Kujavia, Mazowsze (Mazovia), Lower Śląsk (Silesia), and Małopolska (Kóčka-Krenz 1971, 47).

Temple rings occurred singly in graves (graves nos. 9, 10, 23, 52), in pairs (graves nos. 44, 103) or as four pieces (grave no. 50). They were typically found by the skull, on its right or left side, near the temporal bone (fig. 9). When more than one ring

Fig. 8. Grodowice, site 1. Temple rings: 1, 8 – grave 44; 2, 4, 5, 7 – grave 50; 3 – grave 52; 6 – grave 23; 9 – grave 9; 10 – grave 10; 11, 12 – grave 103; 13 – grave from the test trench. 1 – lead; 2, 4, 5, 11, 12 – brass; 3, 6, 9, 13 – silver; 7, 8, 10 – copper or copper alloy. Photo: W. Pohorecki

Table 1. Characteristics of temple rings discovered in graves at Grodowice

Grave	Anthropological analysis	Type acc. to K. Musianowicz	Material	Inner diameter mm	Outer diameter mm	Thickness mm	Figure
T. trench	-	IIIc	silver	10	16x20	4	15:T/1
9	Female, *Ad.*	IIIc	silver	9	14x15	2	18:9/1
10	Female, *Ad.*	III	copper alloy	9x11	15x13	1,6	19:1
23	*Infans II/ Juv.*	III	silver	10x11	15x16	2	21:1
44	Female, *Ad.*	III	lead	8x10	16x18	3	24:1
44	Female, *Ad.*	III	copper/cop. alloy	11x12	17x18	2	24:2
50	Female, *Ad./Mat.*	III	brass	10x12	17x20	3	29:1
50	Female, *Ad./Mat.*	III	brass	8x9	13x15	2	29:2
50	Female, *Ad./Mat.*	III	brass	11	16x20	3	29:3
50	Female, *Ad./Mat.*	III	copper	11x12	17x21	3	29:4
52	Female, *Ad./Mat.*	IIIc	silver	7x8	15x16	4	31:1
103	*Infans* I/II	III	brass	10	13	1,7	34:1
103	*Infans* I/II	III	brass	10x12	14x12	1,5-2	34:2

was found in a grave, there was no regularity in their distribution around the skull. In grave no. 44, where two temple rings were found near the skull, one of them was found to the left and the other acquired during sieving of the fill of burial was probably located to the right of the temple. Of particular interest seems to be the irregular arrangement of temple rings near the skull in grave no. 50, where three rings were recorded by the right temple, and only one by the left temple. One temple ring originating from grave designated as no. 10 was found near the left tibia. Its atypical position is most likely the result of secondary translocation within the grave pit (possibly by burrowing animals). In the remaining cases, the arrangement of temple rings was disturbed to a degree which made even the approximate reconstruction of their original position in grave impossible (graves nos. 23, 52, 103, grave from the test trench of 2005).

Temple rings are commonly believed to be typically female ornaments, worn (as indicated by the name itself) at the temples. Temple rings usually occurred in pairs, one on the left and one on the right side of the head of the deceased woman. Sometimes they were found only on one side (Jaskanis 2008, 192). Far more infrequent are cases where more than two temple rings occurred in one grave (Kóčka-Krenz 1993, 42).

It is assumed that temple rings were usually attached to leather straps that formed a kind of a headband and which was sometimes combined with a textile. The band could also be made of linen or wool (Kóčka-Krenz 1993, 43). As noticed by Z. Rajewski, temple rings could have been sewn onto a coif (Rajewski 1939, 60). According to W. Morawski and E. Zaitz, these ornaments could have also been attached to headscarves, as suggested by the discovery made in grave 12 from the cemetery at Kraków-Zakrzówek, where a temple ring was found together with a fragment of a headscarf (Morawski, Zaitz 1977, 71).

Another way of wearing temple rings was to join them together with thread. Such cases are known, among other places, from cemeteries at Czarna Wielka in Siemiatycze district (Musianowicz 1960, 222-223) and Kobylin-Kuleszki, Wysokie Mazowieckie district (Walicka 1957, 372).

Another category of artefact discovered at the Grodowice necropolis is that of coins. In total, five specimens were found in four graves (nos. 2, 4, 5,

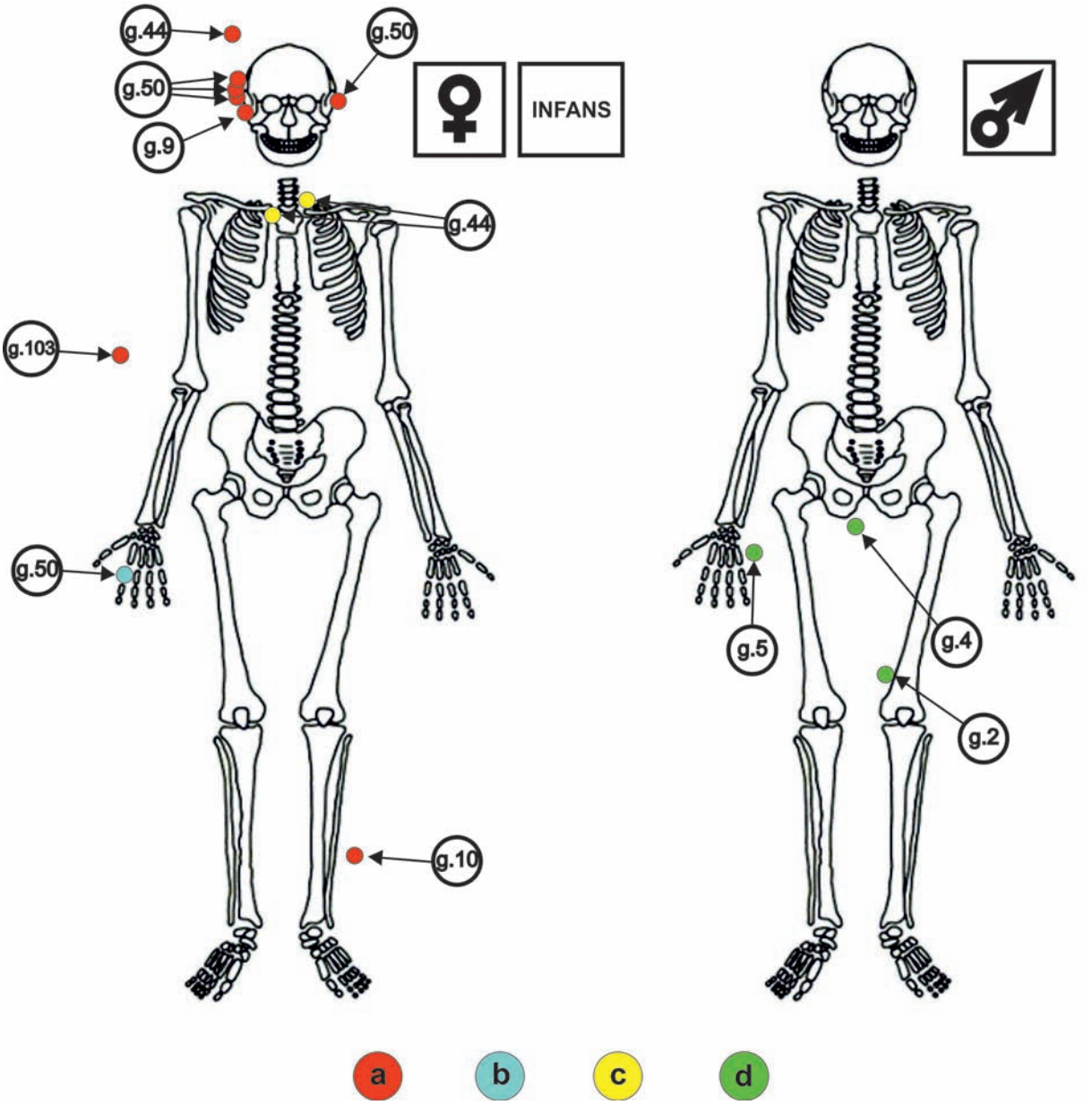

Fig. 9. Grodowice, site 1. Position of the artefacts in graves: a – temple rings; b – finger-ring; c – beads; d – coins

103; fig. 10)[3]. Three of them belonged to inventories of males aged *Adultus/Maturus* (nos. 2 and 4), one was recovered from the burial of an individual of undetermined sex aged *Juvenis* (no. 5), and one from the grave of a child aged *Infans I/Infans II* (no. 103). Coins underwent conservation work and their state of preservation can be described as good. The abrasion of obverse and reverse surfaces recorded on the coins from grave no. 2 (Cat. No. 1/2005; fig. 10:2, 15:2/1) and a coin from grave no. 5 (Cat. No. 4/2005; fig. 10:5, 17:5/1) may testify to their long circulation. The coins were of a similar size (12.4-14.3 mm) and weight 0.68-0.86 g. In grave no. 103 the coin survived only as a fragment (fig. 10:3, 34:3), hence the determination of its original size and weight proved impossible (dimensions of the preserved fragment: 0.9 x 1.6 cm). It is probably a German denarius of Bishop Bernold, issued in the years 1046-1054 AD. Other coins from cemetery belong to widespread forms of cross denarii. Only grave no. 2 yielded two specimens. The first one (Cat. No. 1/2005; fig. 10:2, 15:2/1) dates to a period spanning 1070-1100 AD. The second coin (Cat.

[3] Coins were identified by M. Woźniak from the Emeryk Hutten-Czapski Museum in Kraków and by P. Chabrzyk from the Archaeological and Ethnographical Museum in Łódź.

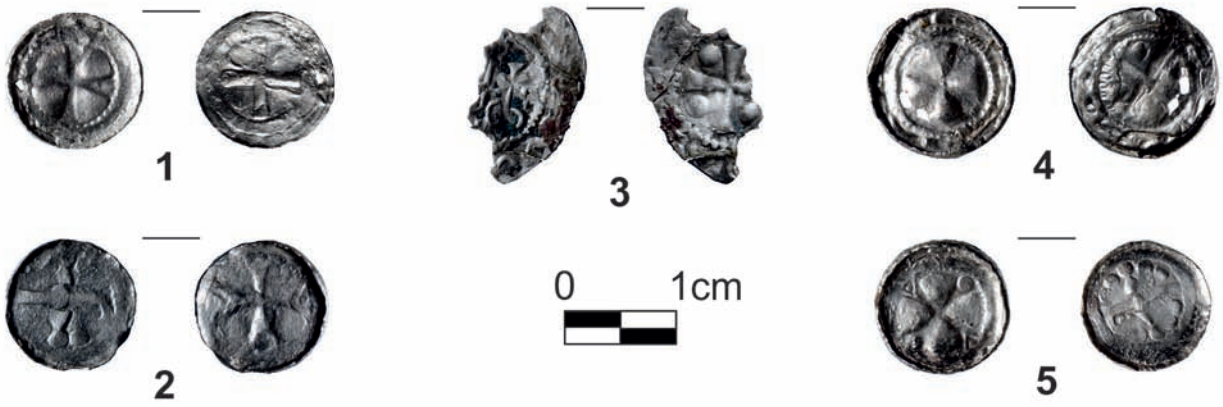

Fig. 10. Grodowice, site 1. Silver coins. 1, 2 – grave 2; 3 – grave 103; 4 – grave 4; 5 – grave 5. Photo: W. Pohorecki

No. 2/2005; fig. 10:1, 15:2/2) was minted between 1065 and 1100, under the reign of King/Emperor Henry IV (1056-1106? AD). In other burials cross denarii occurred singly. Their chronology does not differ much from that mentioned above. The denarius from grave no. 4 (Cat. No. 3/2005; fig. 10:4, 16:4/1) dates to the reign of King/Emperor Henry IV, while the one from grave no. 5 (Cat. No. 4/2005; fig. 10:5, 17:5/1) was minted between 1070 and 1100 AD. In grave no. 2, one of the coins was found near the left femur, while the precise location of the second coin within the grave pit remains unknown (it was found while sieving the soil from the grave pit). In grave 4 the coin was recorded between the femoral bones, at the height of the pelvis, and in grave 5 it was found near the right femur (fig. 9).

The custom of placing coins in graves became widespread throughout vast areas of Central Europe in the early Middle Ages, and its diffusion was apparently fuelled by influences from many directions: from the north, from the south (from the countries representing both Latin and Byzantine cultures), and also from the Avar tribes (Suchodolski 2012, 213, 218). Burials with coins are also recorded in large numbers in the territory of present day Poland, in the basins of the Odra, Warta, and upper Vistula. The majority of such sepulchral finds come from the south of Poland (Potin 1971, 70; Miechowicz 2011, fig. 1).

Among the graves with coins discovered in Pomorze (Pomerania), Wielkopolska (Greater Poland), Małopolska (Lesser Poland), and Śląsk (Silesia), those containing silver coins issued in the 11th, or less often in the 10th century are predominant. The number of graves with coins of a later series is considerably lower (Miechowicz 2011, 337-338; Suchodolski 2012, 214-215, 218). The phenomenon of such an abundant occurrence of 11th-century coins is usually explained with the growing popularity of coins as a means for transactions, and with them having become available for a broader cross-section of the society (Kiersnowski 1958, 181-182; Zoll-Adamikowa 1971, 118; Szczurek 1995, 84-85; Miechowicz 2011, 343; Suchodolski 2012, 219). However, according to R. Kiersnowski, the intensity of this phenomenon was not directly proportional to the stage of economic development in particular regions (Kiersnowski 1958, 186; Suchodolski 2012, 219). A considerable decrease in the number of graves with coins, which is noticeable from the 12th century, may, on the one hand, be connected with the drop in the value of silver (Miechowicz 2011, 342), but on the other hand it may be linked to the transformations in the burial rite, which accompanied the progressive Christianization of the area (Zoll-Adamikowa 1971, 118).

There have been many attempts to explain the genesis of the custom of placing coins in graves, a custom whose roots date back to the classical Mediterranean civilizations (Miechowicz 2006, 89; Suchodolski 2012, 221). Some of the hypotheses have tabled that furnishing graves with coins may be related to the sphere of the magical-religious behaviours of early medieval societies, who wished to protect the living against the destructive actions of the deceased or against their return from the other world (Fisher 1921, 127; Stanaszek 1998, 26; Olesiejczuk 2000, 265; Miechowicz 2011, 349). It

has also been proposed that coins in graves may have played the role of a kind of Charon's obol, enabling the deceased to enter the gates of heaven (Miechowicz 2011, 349).

A coil composed of a variety of beads was found in the cemetery's grave 44, which held the remains of an adult female. 50 complete or slightly damaged beads of glass, carnelian and rocky crystal along with 46 smaller fragments, were found with the skeleton (fig. 25, 26). All the beads were found near the clavicles and cervical vertebrae. This allows us to assume that originally they must have formed a string of beads adorning the neck of the deceased female. Beads made of glass were notably prevalent (47 pieces). Most numerous among them were green conical (type H according to M. Markiewicz) beads (18 complete specimens and 17 fragments; fig. 25:a). Analogous beads are known from site 4 at Kałdus, where they were found in grave no. 87 belonging to a female aged *Adultus* (Markiewicz 2008, 168). The second most numerous group is that of flat-spherical (type D according to M. Markiewicz) beads representing a variety of colours (15 complete, two fragments):

- brown (eight complete, two fragments) are among the less popular forms. Analogies of these beads were discovered in the female grave no. 87 in the Kałdus cemetery as well as in the cemetery at Lubień, Piotrków Trybunalski district (Wójcik and Wójcik 1973, 166, plate V:6) (fig. 25:b).
- blue (one pc) (fig. 25:e).
- liver-red (three pcs) (fig. 25:d).
- undetermined colour (three pcs) (fig. 25:c).

Most of the flat-spherical beads were undecorated, only those of a brown colour were provided with three lemon yellow protrusions (fig. 25:b). Similar beads in Małopolska are known from the cemetery in Strzemieszyce Wielkie (Marciniak 1960b, tab. II:25-28; III:7-8, 13). Analogous beads were also found in other regions of Poland: Kałdus, site 4, Kujavian-Pomeranian voivodeship, grave 217 (Markiewicz 2008, 232, tab. 20:1), Lubień, grave 3 (Kurasiński, Skóra 2012, 161, tab. III:5a), grave 36 (Kurasiński, Skóra 2012, 174, tab. XXVII:3d). Cylindrical beads were also numerous (nine pcs.), the best preserved among which were those of a liver-red colour (five pcs.). Apart from the shapes mentioned above, there also were barrel-shaped beads (fig. 25:g-i). Among the most spectacular forms, which probably occupied a central place in the string, one should mention four beads: two made of carnelian (one spherical, one cuboidal), one of rock crystal, and one of blue glass (fig. 25:j-m). The latter bead deserves particular attention, as four of its walls are decorated with a gold foil in the shape of a rhombus (fig. 25:f). An analogous bead discovered in the early medieval cemetery at Kałdus (site 4) belonged to the inventory of grave no. 70, in which an individual aged *Infans II* was buried (Markiewicz 2008, 163, 233, tab. 19:14). Other similar pieces also comes from the cemetery in Kraków-Zakrzówek, where they were found in a female grave no. 36 (age: *Adultus*) and from the Minsk oblast' in Belarus (unknown locality; Kóčka-Krenz 2007, fig. 16). Most of the beads presented above belong to the types commonly found in early medieval cemeteries in the territory of present-day Poland.

Another artefact from the Grodowice cemetery is the finger-ring found in grave no. 50, which belonged to a female aged *Adultus/Maturus* (fig. 29:5). The ring diameter measured 1.9 cm, and the artefact was made of brass. The finger ring was discovered by the phalanges of the right hand. In the classification of Kóčka-Krenz it belongs to a group of finger rings with connected ends (bands). Analogous or similar undecorated finger rings are relatively common in north-western Slavic cemeteries. The highest concentrations of such finds were recorded in cemeteries from Mazowsze (Masovia), Pomorze (Pomerania), and Central Poland (Kóčka-Krenz 1993, 115). In Małopolska similar specimens are known from such cemeteries as Boratyn, Jarosław district (Glinianowicz, Kotowicz 2016, 212, fig. 97:8), Modlnica, Kraków district (Sztyber 2010a, 40-41; 2015), Samborzec, Sandomierz district (Bartys 1936b, fig. 6:38), Strzemieszyce Wielkie (within the city limits of Dąbrowa Górnicza; Marciniak 1960, 146, plate II:8), Przemyśl, Krasiński Street 49 (Koperski 1989, 416, fig. 4:d; Sosnowska 2010, 130, fig. 17:b) and Przemyśl, Pstrowski Street (Koperski 1988, 395, fig. 3:c; Sosnowska 2010, 119). From the cemetery at Łowce in the Jarosław district a similar finger ring was found, with overlapping, but without the thinned hoop ends (Koperski and Kociuba 1994, 88, fig. 2:b). Finger rings of the type in question are mainly dated to the 11th-12th century, although they sporadically occur up to the 14th century (Kóčka-Krenz 1993, 115). In Małopolska they were discovered mainly in the early medieval burials of females and children. Finger rings in male graves are extremely rare and occur only in the burials of the higher social classes

(Zoll-Adamikowa 1971, 101; 1990; Kubica 2012, 109-110).

From grave no. 44 comes a fragment of an artefact made of copper alloy band, which most likely should be interpreted as a ribbon-like finger ring, decorated with a relief decoration on one side (fig. 24:4). The precise position within the grave pit is unknown.

CHRONOLOGY OF THE CEMETERY

It is very difficult to precisely establish the timeframe when the Grodowice cemetery was in use. Its chronology can only be determined on the basis of the few grave assemblages that contained coins and whose time of emission can be roughly estimated (graves nos. 2, 4, 5, and 103). Other artefacts discovered in graves represent forms which usually are of no use in precise chronological determination. This remark applies especially to glass beads (grave no. 44) and the ring (grave no. 50). The chronology of temple rings representing type III acc. to K. Musianowicz (13 specimens discovered in eight graves), which traditionally are dated to the 10th and 13th century, requires further comment. Recent studies indicate that specimens of this type with an inner diameter of around 1 cm, made of bronze or silver wire, whose thickness does not exceed 0.2 cm, were the only characteristic type of temple ring in the 10th century. Significant changes in stylistics were observed no sooner than in the 11th century, where specimens with an inner diameter of between 1.2 cm and 2 cm were most frequent. According to M. Kara there is a plain chronological caesura between specimens with an inner diameter of between 1.2 and 1.4 cm and those whose inner diameter is between 1.5/1.6 cm and 2 cm. The latter are characteristic no earlier than after the mid-11th century (Kara 2017, 153, and further literature). Similar observations regarding stylistics have also been made for Bohemian and Moravian temple rings. In Bohemia, however, the above-mentioned smallest specimens are dated to the middle or third quarter of the 10th century (Tomková 2012, 169; Tomková, Košta 2015, 291). In Slovakia typo-chronological regularities are not that pronounced (Hanuliak 1994, 40-41).

Comparison of grave inventories with coins and temple rings from Małopolska indicate that the smallest temple rings, especially those made of thick wire, were long-lasting forms found together even with 12th century coins (table 2; fig. 11). Special attention must also be given to the few graves with bigger forms of temple rings that were found together with the early 11th-century coins (table 2, nos. 4, 7, 10, 18). In the case of Grodowice, the finds there include six rings whose inner diameter does not exceed 1 cm (table 1). The rest of them are slightly bigger but none of them exceed 1.5 cm in that respect. It is interesting to note the chronological position of grave 103, which consisted of two relatively early forms of small brass temple rings made of thin wire (average size: inner diameter – 9-10 mm, thickness 1.8 mm) and a silver coin, presumably a German denarius of Bishop Bernold, issued in the years 1046-1054 AD.

Summing up the above argumentation, it must be stressed that the Grodowice cemetery's chronology is based on the few grave assemblages that contained coins, ones that represent forms mostly dated to the 2nd half of the 11th century. When exactly the cemetery started and ceased to function is still open to discussion, especially that some graves are equipped with specimens that are long-lasting forms that were in use from the end of 10th century until the 13th century. In this light we can not completely exclude the possibility that the cemetery started to be used for burying the dead, like many other skeletal necropolises in Małopolska, already at the end of 10th century (Zoll-Adamikowa 1971). On the other hand one of the arguments suggesting the longer use of the cemetery is the presence of graves with temple rings made of thick, silver wire (grave 52 and the grave from the test trench), whose long-use-period in Małopolska is confirmed by a dozen assemblages with coins, especially relatively late emissions issued during the last quarter of the 11th century, in the 12th century, and even the beginning of 13th century (table 2, nos. 9, 14, 15, 19 and 23). As a result, we may estimate the Grodowice cemetery to have been in use for around 50 or perhaps even more than 200 years. In the future more precise data should provide complex radiocarbon dating of skeletal remains from Grodowice[4].

[4] Usefulness of radiocarbon dating in chronology studies of early medieval cemeteries has been proved for few sites; see: Buko, Kara 2014; 2016; R. Grygiel 2014; Goslar 2016.

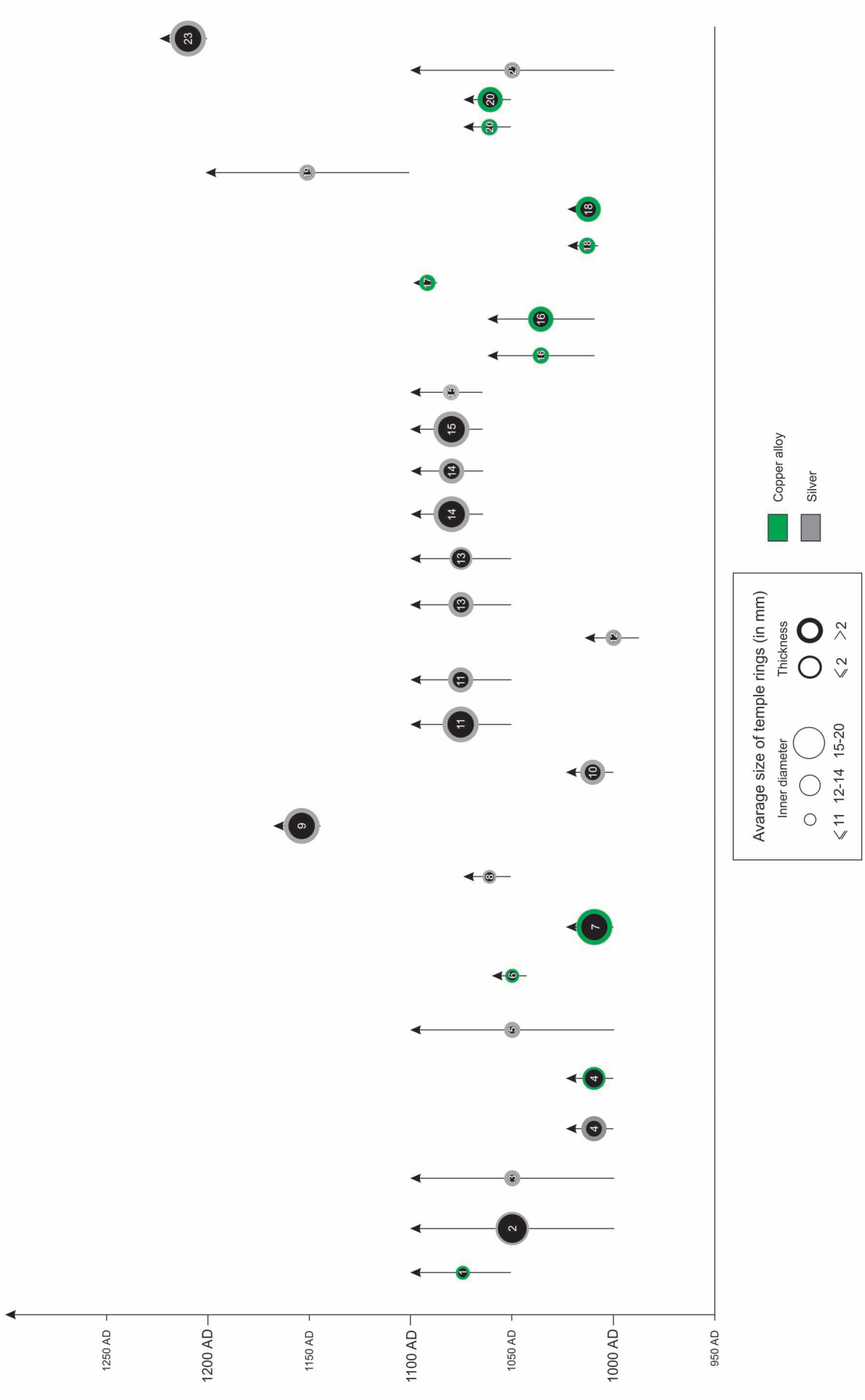

Fig. 11. Early medieval graves in the historical territory of Małopolska equipped with temple rings and coins. Evidence for numbers of finds in table 2

Table 2. Characteristics of early medieval graves with temple rings and coins from Małopolska.

No.	Site, grave	Anthropolog. analysis	Temple ring (K.Musianowicz)	Average size (mm) outer diam. /thick.	Coin	Chronology of coin (*terminus post quem*)
1.	Giebułtów, grave 7	-	1 bronze spec., type III	19/2	Cross denarius	after 1050 AD
2.	Gorysławice, grave 16	Female, *Adultus*	1 silver spec., type III	21/1,5	Cross denarius, CNP VI, 871 var.? (forged coin – Cu+Ag)	11th century AD
3.	Gorysławice, grave 25	Female, *Adultus*	1 silver spec., type III	18/4	Cross denarius (fragm.)	11th century AD
4.	Gorysławice, grave 32	Undetermined	1 bronze spec. + 2 silver spec., type III	I – 15,5/1,5 II – 20/3 III – 17/2,5	Denarius (fragm.) of king/emperor Henry II, Dbg 788?, mint in Mainz?	1002-1024 AD (1002-1014?)
5.	Goszyce, grave 3	-	6 silver spec., type III	I – 21/5 II – 21/5 III – 20/5 IV – 18/4 V – 16/4 VI – 15/4	Cross denarius	11th century AD
6.	Grodowice, grave 103	*Infans* II	2 brass spec., type III	I – 13/1,8 II – 13/1,8	Germ. denarius (fragm.) of Bishop Bernold (?)	1046-1054 AD (?)
7.	Jaksice, grave 1/23	Undetermined	2 bronze spec., type III	I – 23/3 II – 24/3,5	German (?) denarius (fragm.)	beginning of 11th century AD (?)
8.	Kraków-Zakrzówek, grave 33	*Infans* II	1 silver spec., type IIIc	14/2	Cross denarius, CNP V, 617?	1050-1075 AD
9.	Kraków-Zakrzówek, grave 60a	Female, adult	1 silver spec., type IIIc	ca. 25/4,1	Denarius of Bolesław Kędzierzawy, Stronczyński type 59, Suchodolski type 2a	1150-1160 AD
10.	Modlnica, grave 796	Adult	2 silver spec., type III	I – 20/4 II – 18/3	Cross denarius (fragm.), east Saxony, CNP II? Av. 410? 425? Rv. 423?, Kilger type MgHP 1, mint in Magdeburg	Acc. to CNP and Ch. Kilger first decades of 11th century AD
11.	Modlnica, grave 2980	Female, adult	2 silver spec., type III	I – 24/4 II – 24/5	Cross denarius, east Saxony, CNP V, 612-617	Second half of 11th century AD
12.	Modlnica, grave 2991	Undetermined	4 silver spec., type III	I – 16/5 II – 21/8 III – 15/4 IV – 16/4	Germ. denarius (fragm.), similar to Otto-Adelajda type, Dbg 1174?	10th/11th century AD
13.	Modlnica, grave 4768	*Infans* II	11 silver spec. + 1 bronze, type III	I – 20/3 II – 18/2 III – 18/2 IV – 16/2 V – 14/3 VI – 16/2 VII – 15/2,8	Cross denarius, east Saxony, CNP VI, Av. 802-804?, Rv. 799?	Second half of 11th century AD

13.	Modlnica, grave 4768			VIII – 15/2 IX – 19/2 X – 15/2 XI – 15/2,9 XII – 14/2		
14.	Modlnica, grave 4779	Female?, *Juvenis*	5 silver spec.: 4x typ III, 1x type IIIc	I – 25/4,5 II – 30/5 III – 24/5 IV – 30/3 V – 29/4	Cross denarius (fragm.), east Saxony or Poland?, Zbigniew?, CNP VI, 853-864(?), Kilger type Sal D 4:2/2	Acc. to CNP last decades of 11th century; acc. to Kilger 1065-1100 AD
15.	Modlnica, grave 4865	Adult	2 silver spec., type IIIc	I – 21/5 II – 26/4,5	Cross denarius (fragm.), east Saxony or Poland?, Sieciech?, CNP VI, Av. 846-849 or 858, Rv. ?, Kilger type Sal D 4:1/2 (?)	Acc. to CNP last decades of 11th century; acc. to Kilger 1065-1100 AD
16.	Prząsław, grave 23	Female, *Adultus*	12 bronze spec., type III	I – 19/3,5 II – 19/3,9 III – 19/3,9 IV – 20/4,2 V – 21/4,2 VI – 21/3,9 VII – 21/4,7 VIII – 20/3 IX – 20/3,4 X – 21/4,4 XI – 19/3,1 XII – 20/3	Denarius of Albert II from Namur (fragm.), Dbg 165	1018-1064 AD
17.	Prząsław, grave 28	Female, *Maturus*	2 bronze spec., type III and IIIc	I – 16/3,6 II – 16/2,9	Cross denarius, CNP VII, 986	1075-1095 AD
18.	Prząsław, grave 30	Female, *Adultus*	3 bronze spec., type IIIc	I – 21/5,5 II – 20/4 III – 21/5,1	Obol of Stephen I of Hungary (fragm.), Suchodolski type 3b	1015-1038 AD
19.	Samborzec, grave 45	Female, *Maturus*	1 silver spec., type IIIc	19/4	Fragm. undetermined	12th century AD
20.	Samborzec, grave 58	Female, *Maturus*	2-3 bronze spec., type III	I – 17/2,5 II – 16/3,5 III – - /2,5	Cross denarius, CNP V, 607-624	1050-1075 AD
21.	Turbia, grave 2	Undetermined	2 silver spec., type IIIc	I – 16/4 II – 18/3,5	Cross denarius (fragm.), CNP VI?	11th century AD
22.	Wawrzeńczyce, grave 33	Female, *Adultus*	No detailed inf.	-	Denarius of Władysław Herman, CNP 1314-1322?, mint in Kraków	1079-1102 AD
23.	Złota Pińcz., grave 63	Female, *Maturus*	2 bronze spec. (silver plated), type III	I – 51/3 II – 45/4	Polish denarius, Stronczyński type 176	Beginning of 13th century AD
24.	Złota Sand., grave 9	Female, *Senilis*	1 spec. undetermined	-	Cross denarius	11th century AD

Specific abbreviations: Kilger = Kilger 2000; Stronczyński = Stronczyński 1883-1884 ; Suchodolski = Suchodolski 1973 and 1991; CNP = Gumowski 1939; Dbg = Dannenberg 1876-1905. Characteristics of coins after: Bartys 1936a; Miśkiewicz 1967; Morawski, Zaitz 1977; Sztyber, Woźniak 2012; Reyman et al. 2013; Śnieżko 2016; Archives of the State Archaeological Museum in Warsaw.

FINAL REMARKS

In the territory of historical Małopolska, numerous inhumation cemeteries are known that were in use from the end of the 10th century until the end of the early Middle Ages. Most of them were discovered within or in the immediate vicinity of large strongholds belonging to the Piast period in Kraków, Wiślica, and Sandomierz (fig. 12, 13, 14). The Grodowice necropolis is an example of a flat cemetery with graves arranged in rows, which is very common in early medieval Małopolska. Its location on an exposed land form is also typical for the majority of such sites in Małopolska (Zoll-Adamikowa 1971, 10). The cemetery at Grodowice has not been fully explored. However, the fact that most of its borders were identified allows us to assume that the necropolis probably consisted of no more than 50 burials, which for Małopolska places it in the category of medium-size cemeteries. Cemeteries of a similar size were discovered, among other places, at Witów, Proszowice district (Godlewski 2009; Gawlik and Godlewski 2009), Modlnica, Kraków district (Sztyber 2010a; 2015), at Szczepański Square in Kraków (Dubis 2015). It is worth noting the irregular spatial structure of the necropolis, which consists of one large cluster of graves and two separate outlying burials. A similar arrangement of graves has sometimes been recorded at other medieval or modern cemeteries.

The outlying burials or isolated groups of graves are most often interpreted as belonging to individuals excluded from the given society. In Poland, in accordance with cemetery law, the mortal remains of those who died while excommunicated or in a state of deadly sin (usurers in particular) were buried outside the sacred area (Wójcik 1958,

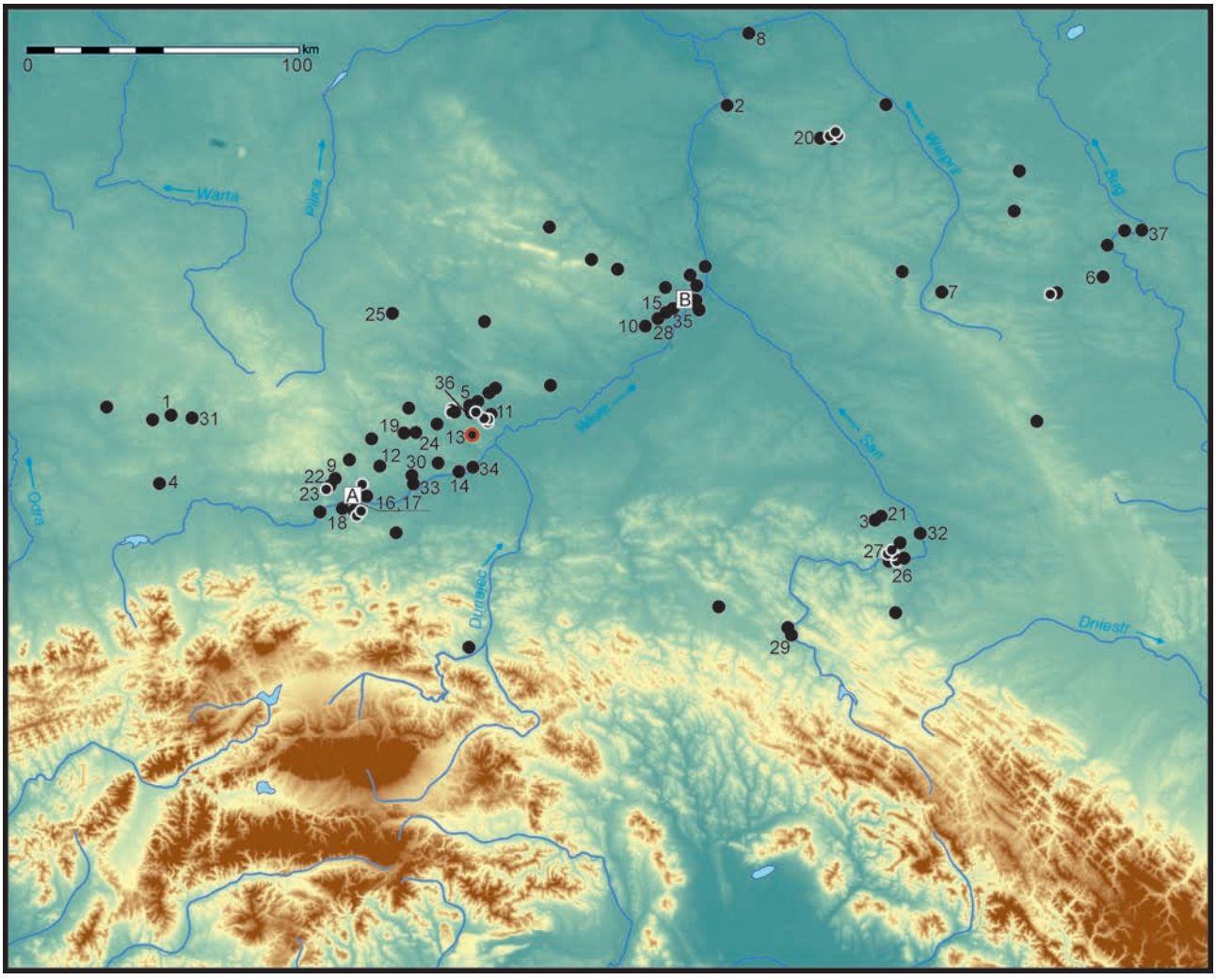

Fig. 12. Early medieval inhumation graves in the historical territory of Małopolska.
Evidence for numbers of non-churchyard cemeteries in table 3

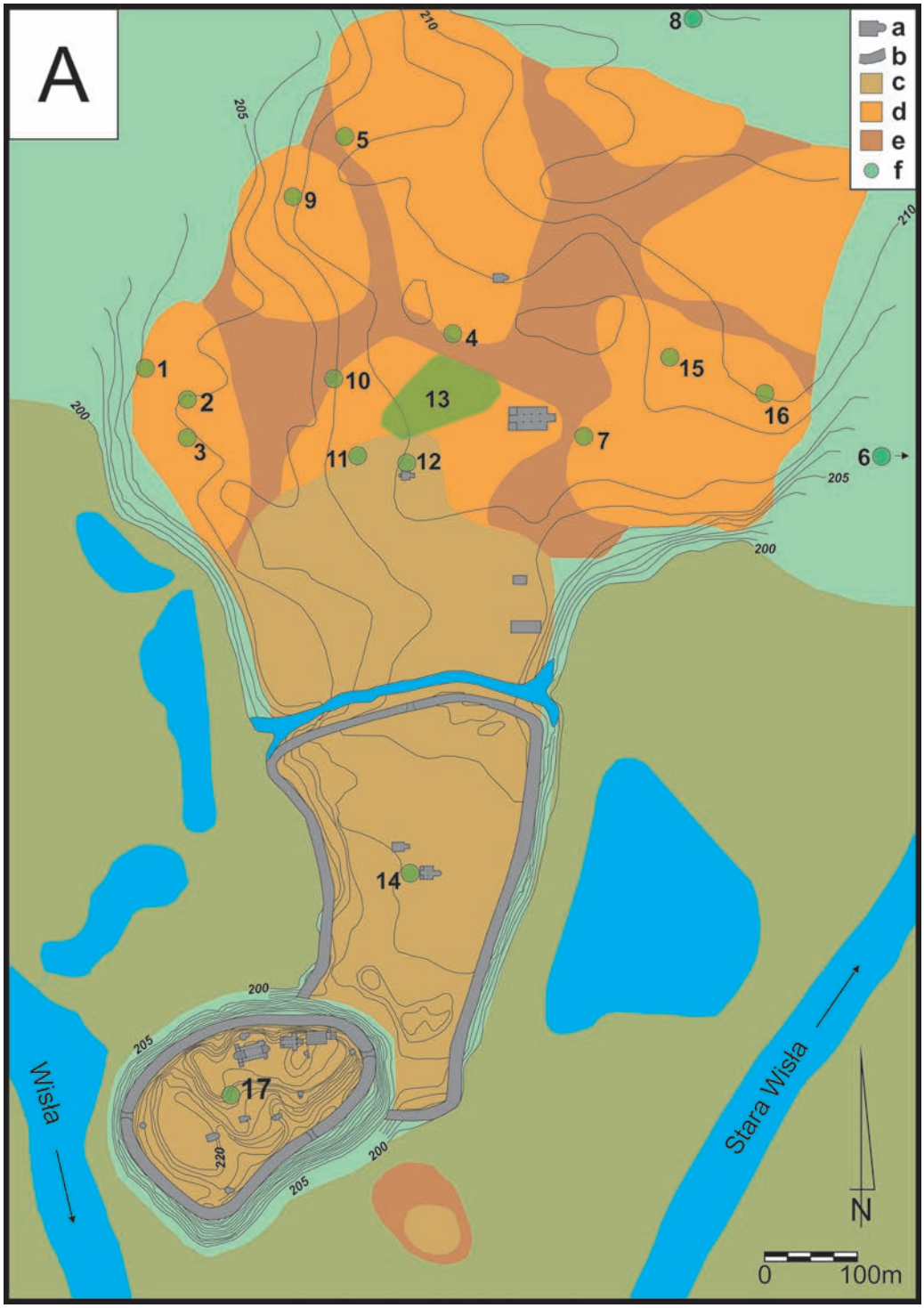

Fig. 13. Kraków before foundation of the town. a – pre-romanesque and romanesque stone-architecture; b – early medieval ramparts of Wawel and Okół (phase after 10th century AD); c – settlement zones before 11th century AD; d – settlement zones since 11th century AD; e – settlement zones in 12th and first half of 13th century AD; f – early medieval inhumation graves: 1 – St. Anne's Street, no. 12; 2 – corner of St. Anne's and Jagiellońska Streets; 3 – Jagiellońska Street, no. 4; 4 – St. Ian's 3 Street; 5 – St. Marc's Street, no. 3; 6 – St. Nicholas' Church; 7 – Little Market Square 1; 8 – Square of Jan Matejko (courtyard of Jan Matejko Academy of Fine Arts); 9 – Szczepański Square; 10 – Main Market Square (by Szewska Street); 11 – Main Market Square (between Sukiennice and Bracka Street); 12 – St. Adalbert's Church; 13 – cemetery at Main Market Square (graves discovered under Sukiennice and between Sukiennice and St. Mary's Church); 14 – St. Andrew's and St. Martin's Churches; 15 – St. Thomas Street, no. 25; 16 – St. Thomas' Street, no 34; 17 – Wawel (St. Leonard's Crypt; near bastion of Władysław IV Vasa; beneath St. Margaret's Chapel; Stefan Batory Courtyard; west wing of the castle; vicinity of Rotunda of Virgin Mary; wide area of church B; area X) (after Poleski 2010, with modifications and additions)

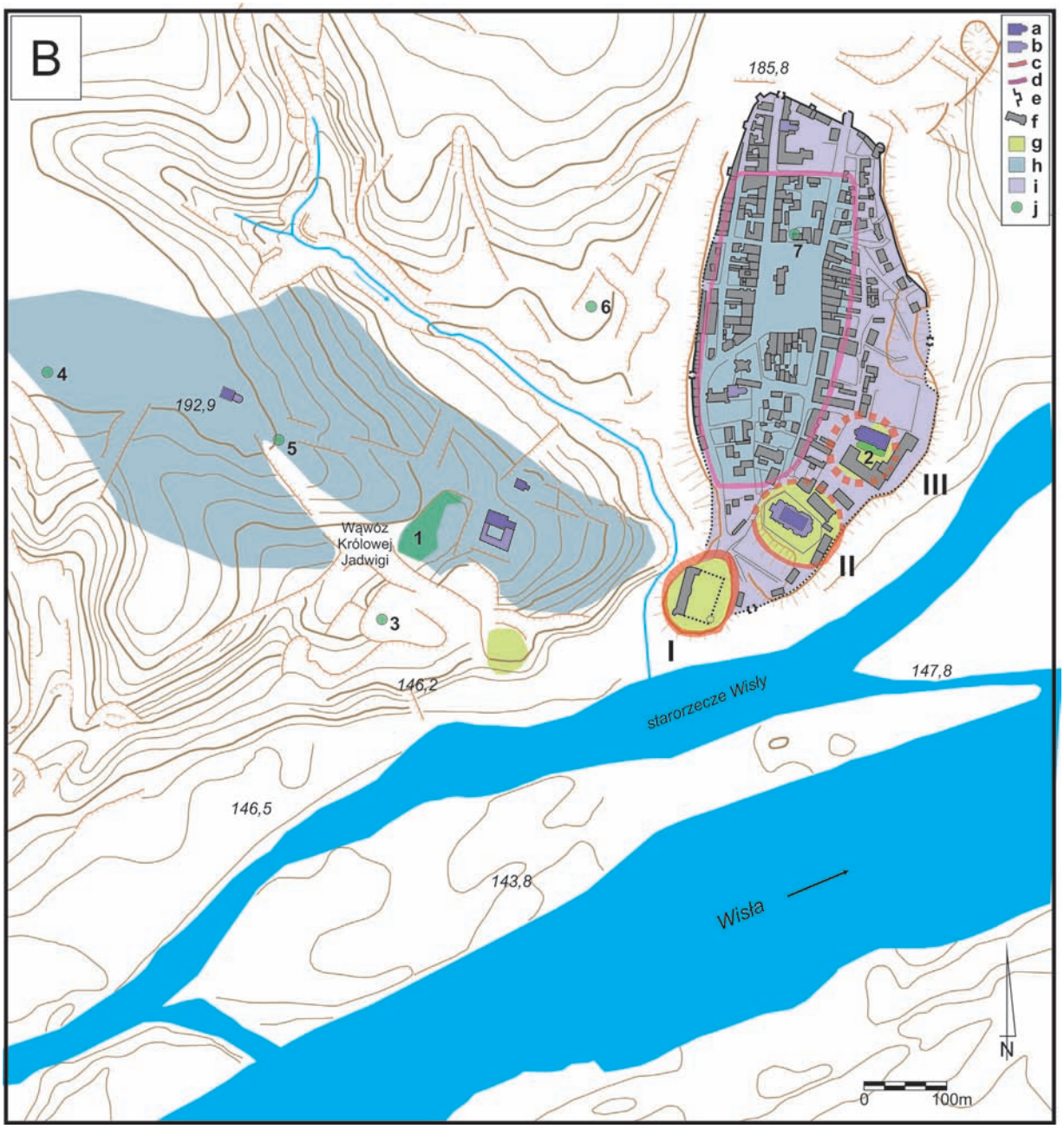

Fig. 14. Sandomierz during Middle Ages. I – hill castle; II – cathedral hill; III – Collegium Gostomianum. Early medieval inhumation graves. a – romanesque stone churches; b – later churches; c – ramparts in 12th and 13th century AD; d – fortifications after 1286 AD; e – late medieval city walls with towers and gates grounded in time of Kazimierz Wielki; f – town buildings, state in 19th century AD; g – zones settled since the end of the 10th century until 11th century AD; h – settlement zone since 12th century; i – late medieval phase; j – early medieval inhumation graves: 1 – cemetery on St. Jacob's Hill; 2 – Collegium Gostomianum (churchyard cemetery at St. Peter's Church); 3 – Queen Jadwiga Street, no. 5; 4 – between Staromiejska and Podgórze Streets, site 45; 5 – Staromiejska Street, no. 9; 6 – graves on Reformackie Hill, site 40; 7 – Main Market Square cemetery (graves from Opatowska Street, Little Market Square and north part of Main Market Square) (after Poleski 2010, with modifications and additions)

196). Exceptions to this rule was the denial to bury suicides in the cemetery, something known from the Late Middle Ages. These exceptions applied mainly to those who were considered to be true Christians or otherwise meritorious (Duma 2010, 63).

The burials were aligned along an east-west axis, which is the predominant form of burial in the discussed necropolis, and this is typical of the early medieval cemeteries in Małopolska. However, the presence of single graves of a different orientation

is not uncommon in the region. In some of the burials, traces have been found of some sort of construction of an organic nature within the burial pit. These could be the remains of coffins or timber settings, whose presence was recorded at several other early medieval cemeteries in Małopolska, for example at Modlnica, Kraków district (Sztyber 2010a, 16-19; 2015), in Sandomierz on St. Jacob Hill (Gąssowski 1969, 430-431) and at Trepcza-Horodyszcze, site 2, in the Sanok district (unpublished materials; the discovery of the cemetery was briefly mentioned in Ginalski, Kotowicz 2004; "Informator Archeologiczny" 1997, 221-222; 1998, 205-207). The arrangement of the bodies of the deceased, which in most cases were lying prone with their hands alongside the body and their heads to the west, is also very typical for the early medieval burial rite. At Grodowice, the exceptions from the above are rare, in a manner similar to other early medieval cemeteries from Małopolska, such as Lelowice, Proszowice district (Rodak 2002, 125), Przemyśl, Grunwaldzka Street 106 (Koperski 1989, 405), Sandomierz – St. Jacob Hill (Gąssowski 1969, 429), Wawrzeńczyce, Kraków district, site 32 (Mazur and Mazur 2011, 426). Grave goods were found in only a few graves, and they belonged to individuals of various sex and age. The richest finds were discovered in graves holding the remains of adult women and a child. Similar tendencies in furnishing the burials of children and adult women are recorded at other early medieval cemeteries in Małopolska (Kubica 2012, plate 14:a-c). The marginally diversified forms of ornaments and elements of costume, commonly known from cemeteries in western Slavdom, were the predominant grave finds. However, the absolute lack of tools (knives in particular) in the graves is striking, as such artefacts are often discovered at other cemeteries.

Mitochondrial DNA (mtDNA) sequence analysis of the hypervariable control region has been shown to be an effective tool supporting classical archaeological and anthropological methods. However, interpretations based on 13 samples can only result in a very rough estimation of the medieval populations' affinity. To investigate the genetic connections between medieval and modern populations analysis of the whole mitochondrial genome and nuclear DNA markers is required. Nonetheless, the results presented here are the first successful attempt to show the mtDNA variability of a medieval population from historic Małopolska.

During the period when the Grodowice necropolis was in use (approximately in the end of the 10th century, in the 11th century, and perhaps also in the 12th century), deep transformations of the burial custom in vast areas of Central Europe are observed. Those changes are commonly believed to coincide with the Christianization of the West Slavic populations. One of the main manifestations of such changes is the spread of inhumation in accordance with Christian rituals, almost entirely replacing in most areas the older forms of pagan burial. H. Zoll-Adamikowa, in her fundamental publication regarding early medieval inhumation cemeteries from historical Małopolska, pointed to the existence of two types of necropolises (H. Zoll-Adamikowa 1971, 123). First are churchyard cemeteries located close to sacral buildings, which apparently had been recognized by the Church as a proper form of Christian burial due to the survival into younger stages of the Middle Ages, up to modern times. The second type of cemeteries including flat necropolises with graves arranged more or less in rows, located far from churches, as used in the upper Vistula basin between the 10th and the 13th century (with small exceptions), is a time-limited phenomenon. Those cemeteries are often called row-like or rural cemeteries. These are characterized by a fairly similar position of the deceased, buried typically prone on their backs, with their heads to the west or east, with western orientation being predominant. Burials are commonly equipped with various objects – mainly dress accessories, less frequently coins, tools, toiletries, vessels, and quite sporadically weapons and objects connected with magic (e.g., kaptorgas, belemnites, or birds' eggs).

The cemetery at Grodowice refers to the latter category, with its quite regular arrangement of graves which are almost in rows. However, this necropolis differs from typical non-churchyard cemeteries such as Kraków-Zakrzówek (Morawski, Zaitz 1977), mainly in its relatively low percentage of burials furnished with grave goods and the marginal diversity of the artefacts discovered in graves. Another argument for the non-churchyard character of the Grodowice necropolis is the lack of information in written accounts that would confirm the presence of a church in the area of the cemetery or in its immediate vicinity, which is additionally confirmed by the results of a geomagnetic survey conducted on the site.

Table 3. Non-churchyard cemeteries from historical Małopolska

No.	Site	Number of graves	% of equipped graves	Literature
1	Będzin-Grodziec	6	83.3	Smutek 1952; Zoll-Adamikowa 1966, 50-51
2	Bochotnica, Puławy district, site 33	2	100	Gumowski 1939; Żaki 1974, 331; Głosek 1984; Lis 1996; Rymkiewicz 1996; Reyman-Walczak et al. 2013, 28 no 4
3	Boratyn, Jarosław district	52	38.4	Glinianowicz, Kotowicz 2016
4	Cielmice, Tychy district	28	46.4	Zoll-Adamikowa 1966, 33-35; Szydłowska 1967; Foltyn 2008, 13-32, 40-45
5	Chroberz, Pińczów district, "Zamczysko" site	4	25	Dąbrowska 1964; Zoll-Adamikowa 1966, 33
6	Czerniczyn, Hrubieszów district, site 3	24	16.6	Borowska-Strugińska 2017; Dzieńkowski 2017
7	Deszkowice, Zamość district, site 1	9	0	Mitrus 1998; 1997 (unpublished materials in Regional Museum in Zamość)
8	Drążgów Kolonia, Ryki district, site 1	3	66.6	Kokowski *et al*. 1988; Castagne, Kokowski 1989; Kokowski and Kokowska 1997
9	Giebułtów, Kraków district	20	55	Zoll-Adamikowa 1966, 36-41; Reyman-Walczak et al. 2013, 36, no 18
10	Gnieszowice, Sandomierz district	9	55.55	Gardawski, Miszkiewicz 1956; Zoll-Adamikowa 1966, 41
11	Gorysławice, Busko district	50	48	Charzewska 1963; Szymański 1963; Zoll-Adamikowa 1966, 42-46; Reyman-Walczak et al. 2013, 40-41, no 23
12	Goszyce, Kraków district, site 1	8	62.5	Bartys 1933; Zoll-Adamikowa 1966, 48-50
13	Grodowice, Kazimierza Wielka district	35	32	Kubica 2012; Kubica-Grygiel 2014; this volume
14	Jaksice, Proszowice district, site 1 and 2	27 or 30	22.2	Zoll-Adamikowa 1966, 53-58; 1971, 164; Miśkiewicz 1968; Reyman-Walczak et al. 2013, 49, no 32
15	Kamień Plebański, Sandomierz district, site 7/39	13	30.8	Kizowska 1994; Bajka, Florek 2011, 177; Florek 2016
16	Kraków, Szczepański Square	58	15.5	Dubis 2016
17	Kraków, Main Market Square	174	na	Głowa 2008; 2010; unpublished materials in collection of Historical Museum of Kraków
18	Kraków-Zakrzówek	76	73.7	Gleń 1977; Kaczanowski 1977; Morawski, Zaitz 1977; Reyman-Walczak et al. 2013, 78-79, no 50; Błaszczyk et al. 2015
19	Lelowice, Proszowice district, site 4	2	50	Mazurkiewicz 2002; Rodak 2002
20	Lublin-Sławinek	85	na	Rozwałka et al. 2006, fig. 25; 2010, 24-25; Polańska 2011; Reyman-Walczak et al. 2013, 86-87, no 60; unpublished materials in the Museum in Lublin
21	Łowce, Jarosław district	2	100	Koperski, Kociuba 1994, 87-91
22	Modlnica, Kraków district, site 5	89	51.7	Kępa et al. 2009; Sztyber 2010a; 2015; Sztyber, Woźniak 2012; Reyman-Walczak et al. 2013, 124-126, no 70; Kołodziej et al. 2015; Woźniak 2015

23	Modlniczka, Kraków district, site 9	6	100	Szczepanek 2010; Sztyber 2010b; unpublished materials in the collections of the Krakowski Zespół do Badań Autostrad
24	Pałecznica, Proszowice district	30	16.6	Rogozińska-Goszczyńska 1966, 253-257; 1968, 416-423; Boruc 1971; Zoll-Adamikowa 1971, 172-174
25	Prząsław, Jędrzejów district	49	59.2	Dąbrowski 2012; Nowaczyk and Nowaczyk 2012; Śnieżko 2016; unpublished materials in the National Museum in Kielce
26	Przemyśl, Krasińskiego 7	8	50	Koperski 1987, 209-239; 2010a, 121-125
27	Przemyśl, Rycerska	16	81.2	Koperski, Parczewski 1978a; Koperski 1996; 2003; 2010b; Informator Archeologiczny 1983, 220
28	Samborzec, Sandomierz district	68	66.2	Bartys 1936b; Sarama 1956; Zoll-Adamikowa 1966, 86-93
29	Sanok, Castle Hill	54	20.4	Kępa, Głąb 2011; Zielińska, Kotowicz 2011
30	Stręgoborzyce, Kraków district, site 38	46	na	Mietlińska 2015; unpublished materials in the Institute of Archaeology, Polish Academy of Sciences in Kraków
31	Strzemieszyce Wielkie, Będzin district	103	56.3	Marciniak 1960; Zoll-Adamikowa 1966, 116; Reyman-Walczak et al. 2013, 33-34, no 13
32	Walawa, Przemyśl district	88	35.2	Petehyrycz, Ters'kyj 1997
33	Wawrzeńczyce, Kraków district	80 (150)	51.2	Mazur and Mazur 2011; unpublished materials in private collection
34	Witów, Proszowice district, site 1	36	33.3	Garbacik 2005; Pacocha et al. 2006; Gawlik, Godlewski 2008; 2009; Reyman-Walczak et al. 2013, 159-160, no 111; unpublished materials in the collections of the Institute of Archaeology, Jagiellonian University in Kraków
35	Złota, Sandomierz district	23	73.9	Gąssowski 1953; Zarzycka 1953; Zoll-Adamikowa 1966, 135-138
36	Złota, Pińczów district	126	50	Zoll-Adamikowa 1966, 133-135; 1971, 188-192; Miśkiewicz 1967; Wierciński 1967; Komitowski 1975; Reyman-Walczak et al. 2013, 176-177, no 120
37	Zosin, Hrubieszów district	6	83.3	Dzieńkowski, Gołub 2012, 40-41; unpublished materials in the Museum in Hrubieszów

From the territory of Małopolska we know 37 sites that could be assessed as non-churchyard cemeteries (table 3). The cemetery at Grodowice is one of the better investigated sites of this kind in the region. Other relatively well-investigated non-churchyard cemeteries are known from Giebułtów, Kraków district (table 3, no 9), Gorysławice, Busko district (table 3, no 11), Jaksice, Proszowice district (table 3, no 14), Kraków-Main Market Square (table 3, no 17), Kraków-Zakrzówek (table 3, no 18), Modlnica and Modlniczka, Kraków district (table 3, nos. 22, 23), Pałecznica, Proszowice district (table 3, no 24), Wawrzeńczyce, Kraków district (table 3, no 33), Witów, Proszowice district (table 3, no 34), and Złota Pińczowska, Pińczów district (table 3, no 36).

Non-churchyard cemeteries are characterized by the presence of attributes incompatible with the Church's eschatological doctrines. Thusly should we regard the non-western orientation of the deceased or equipping them with funerary gifts, including in particular weapons, vessels, tools, everyday use objects, or objects related to magic. These discrepancies are primarily explained by the nature of conversion during the initial stage of Christianization of Polish lands, carried out by relatively few clergymen. In such circumstances, only the most evident manifestations of paganism must have been banned. In the sepulchral sphere this must have included cremation and building burial mounds over the remains of the dead, as evidenced above ally by

the sudden disappearance of both features in newly Christianized areas (H. Zoll-Adamikowa 1995, 178-179).

It is believed that the non-churchyard cemeteries in Małopolska started to disappear in the first half of the 12th century. This coincides with the increase in number of Christian churches, especially private and monastic foundations, where before the development of the parish network, lively pastoral activity was carried out. This could have contributed to the further Christianization of the funeral rite and its transformation into a ceremony accompanied by a priest in the churchyard cemetery. Therefore, it cannot be ruled out that the Grodowice necropolis probably ceased to function as a result of the construction of churches in nearby Kazimierza Mała (probably as early as in the 11th century) and Bejsce (12th century or the first half of the 13th century), which gave rise to future parishes in the Wiślica provostry (Wiśniowski 1965, 59, 76-77).

CATALOGUE OF THE GRAVES

Grave from the test trench in 2005 (fig. 15) – Burial discovered during a test trench early spring 2005. On the site's surface fragments of human bones were found, ones badly destroyed by ploughing. At a depth of 30 cm from the present day ground surface the remains of a burial pit irregular in plan, elongated along an east-west axis, and size 194x62 cm was found. The fill of the burial pit was homogenous with dark-brown humus soil. Part of a skull, tibias, and fibulas were in anatomical position. Dislocated bones were discovered in the north-east part of the burial pit and its immediate surrounding. In this place a temple ring, which was presumably ploughed from the grave, was found. The deceased was probably buried head to the west, in a supine position.

Anthropological analysis. –

Artefacts recorded in a grave.

1. Silver temple ring with decoration in the form of parallel grooves on the loops, type IIIc acc. to K. Musianowicz. Size: inner diam. – 10 mm, outer diam. – 16x20 mm, thickness – 4 mm. Cat. No.: 8/2005.

Grave 2 (fig. 15) – at a depth of 20-30 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 244x116 cm was found. The burial pit was dug into the fill of earlier, prehistoric feature (no. 7). The bottom was flat and was recorded at 40 cm. The outlines of the burial pit were clearly marked and a little bit destroyed in the east part due to animal activity. The fill of the burial pit was non-homogenous, spotted, with brown and dark-brown humus soil mixed with lumps of loess. In the central part there was a darker, rectangular in shape filled in with dark-grey humus soil; this might have been traces of constructions made of organic materials, a wooden coffin in particular. Within its outline, at a depth of 30-40 cm, well-preserved human bones were discovered.

The deceased was buried head to the west, in supine position with arms stretched along the body. Within the fill two coins were discovered. One of the coins (1) was found near the left femur at a depth of 36 cm. The second one (2) was found while sieving the soil from the grave pit, and thus has no precise location within the burial pit.

Anthropological analysis. Male, *Adultus/Maturus*. Pathological changes and injuries: osteoma of parietal bone; degenerative diseases of articular surface of vertebrae, phalanges; enamel hypoplasia of molar teeth and lower incisors; dental caries of all teeth in varying degree.

Artefacts recorded in a grave.

1. Silver coin. Cross denarius with visible but worn surfaces that suggest long circulation. Numismatic description: CNP 986, CNP VII, 964, 967-998. Chronology acc. to Ch. Kilger ca. 1070-1100 AD. Size: diam. – 12.8 mm. Weight 0.74 g. Cat. No. 1/2005.

2. Silver coin. Cross denarius. Numismatic description: CNP 860?; CNP VI, 814, 834, 836-850, 854-868. Chronology acc. to Ch. Kilger ca. 1065-1100 AD, King/Emperor Henry IV (1056-1106 AD)?. Size: diam. – 13.6 mm. Weight: 0.68 g. Cat. No. 2/2005.

Grave 3 (fig. 16) – at a depth of 30 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 240x130 cm was found. The bottom was flat and was recorded at 40 cm. The outlines of the burial pit were discernible and a little bit destroyed in the east-south part due to

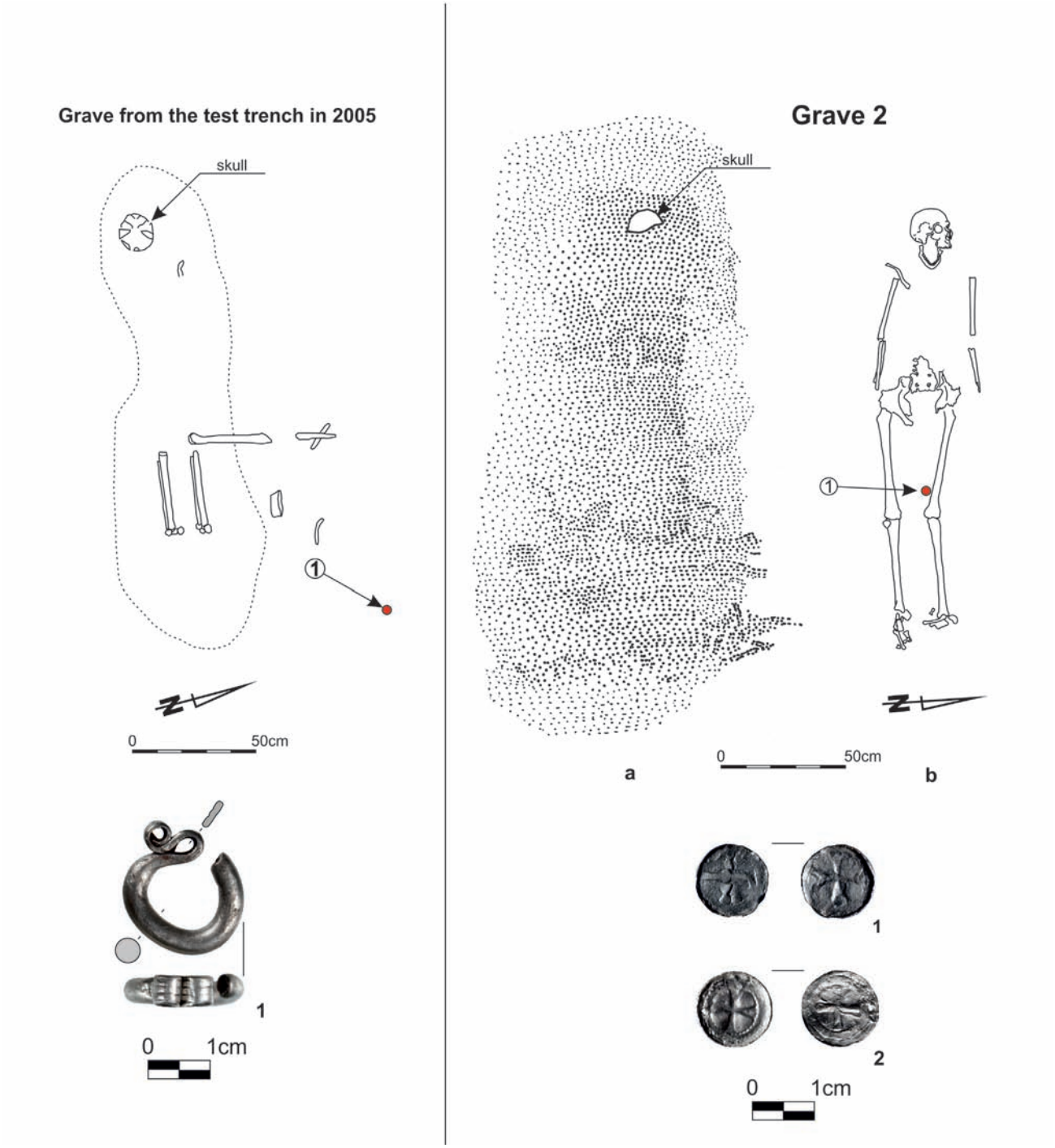

Fig. 15. Grodowice, site 1. Grave from the test trench in 2005: skeleton's figure with an outline of a bottom part of a burial pit: 1 – silver. Grave 2: a – plan of a burial pit at a depth of 30 cm, b – skeleton's figure; 1, 2 – silver. Photo: W. Pohorecki

modern construction works. The fill of the burial pit was non-homogenous, spotted, with brown and dark-brown humus soil mixed with yellow lumps of loess. No traces of constructions made of organic materials were recorded. Within the burial pit no human remains were found. No artefacts were found.

Anthropological analysis. –

Artefacts recorded in a grave. –

Grave 4 (fig. 16) – at a depth of 25 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 258x96 cm was found. The grave pit was dug into a natural loess structure and destroyed the fill of earlier, prehistoric features (nos. 7 and 8). The bottom was flat and was recorded at 45 cm. The outlines of the burial pit were clearly

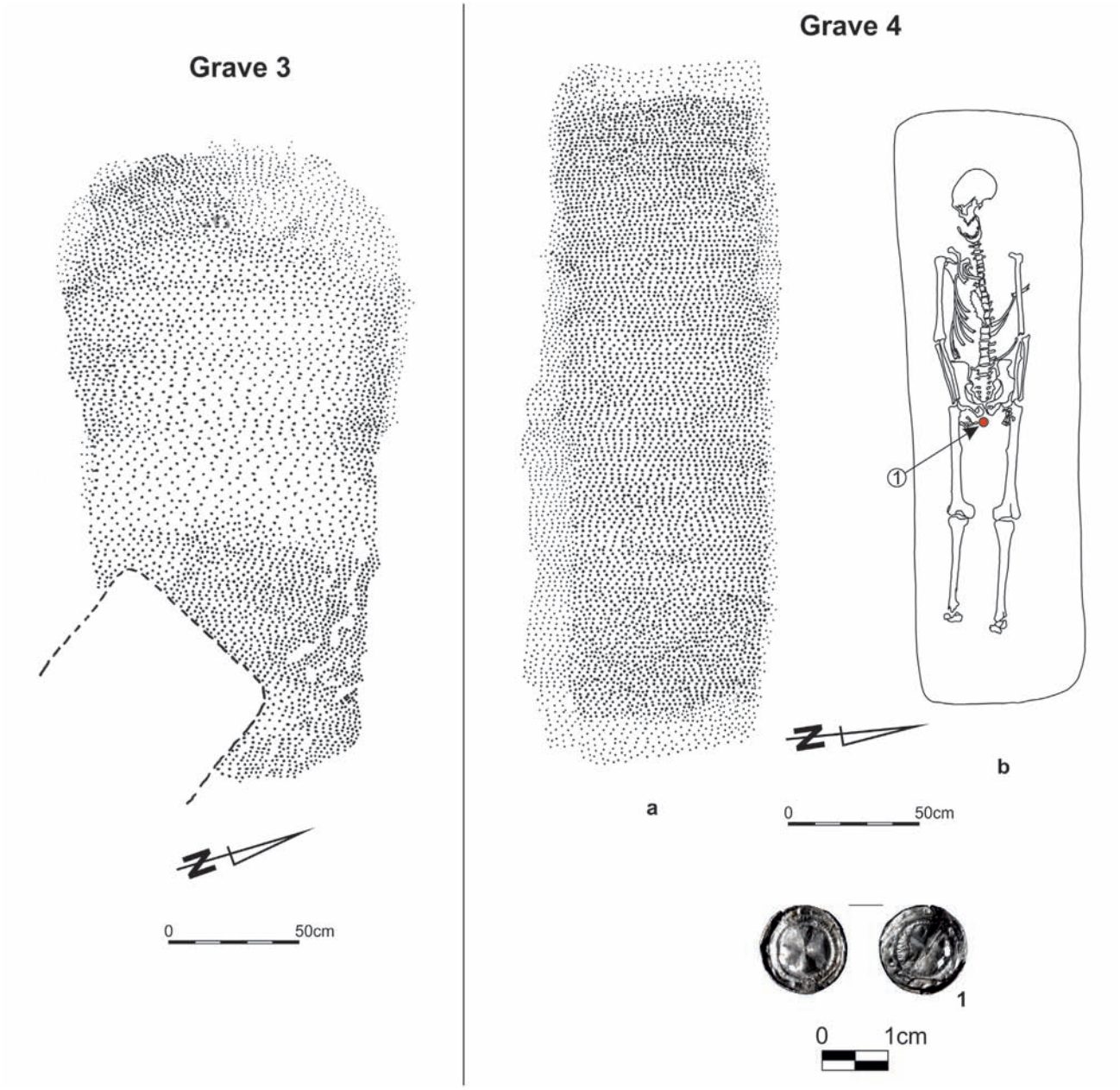

Fig. 16. Grodowice, site. 1. Grave 3: plan of a burial pit at a depth of 30 cm. Grave 4: a – plan of a burial pit at a depth of 25 cm, b – skeleton's figure with an outline of burial pit observed during exploration; 1 – silver. Photo: W. Pohorecki

marked, only in the north part they were mixed with the fills of object 7 and 8. The fill of the burial pit was non-homogenous with dark-brown humus soil; only in the margin of the burial pit was it brown. At a depth of 30-45 cm very well-preserved human remains were found. The deceased was buried head to the west, in supine position with the arms stretched along the body. Between the femur bones near the pelvis a coin was found (1).

Anthropological analysis. Male, *Adultus/Maturus*. Pathological changes and injuries: –

Artefacts recorded in a grave.

1. Silver coin. Cross denarius. Numismatic description: CNP 834-841; CNP VI, 814, 834, 836-850, 854-868. Chronology acc. to Ch. Kilger ca. 1070-1100. Size: diam. – 14.3 mm. Weight 0.82 g. Cat. No. 3/2005.

Grave 5 (fig. 17) – at a depth of 20 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 136x96 cm was found.

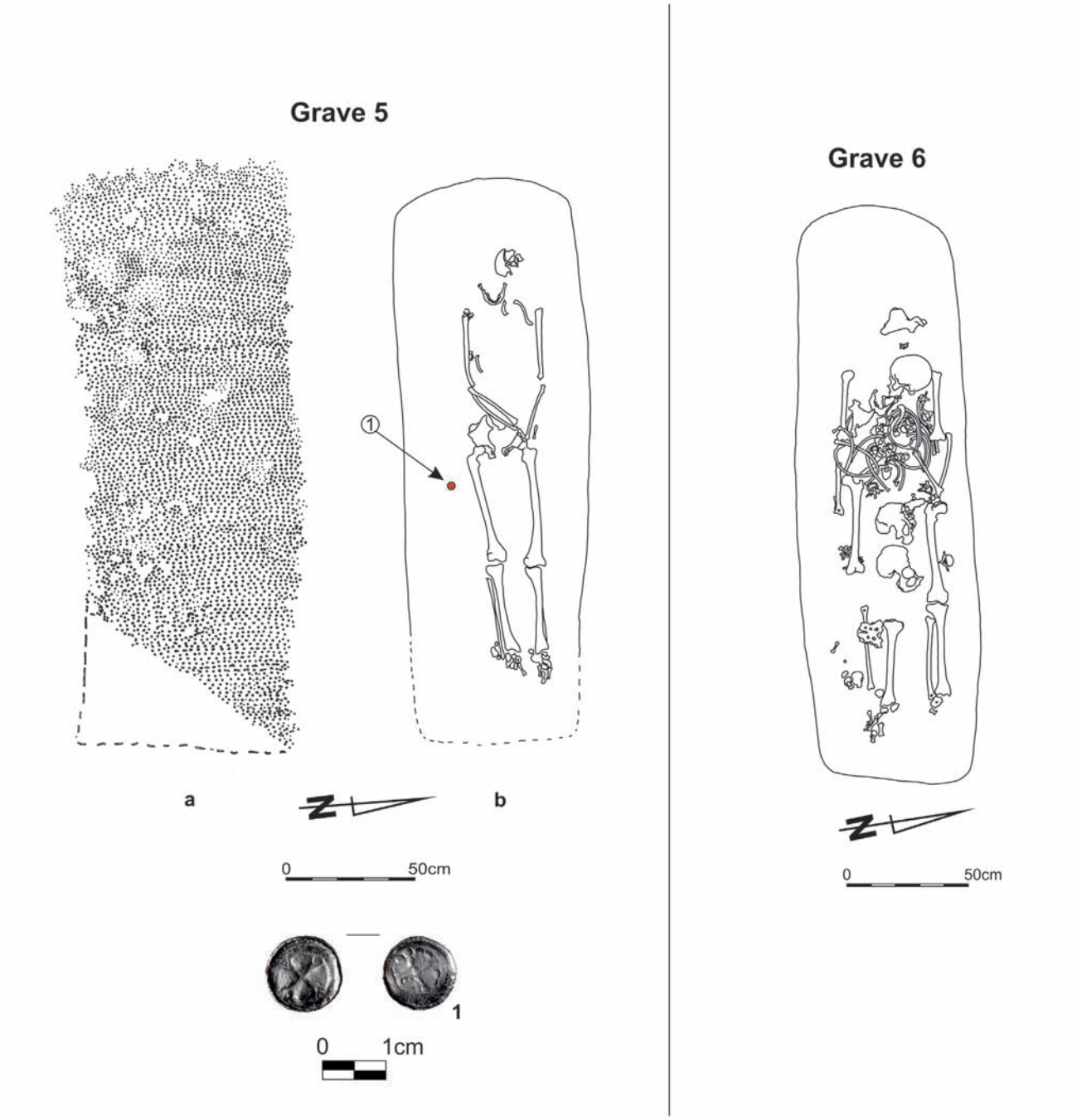

Fig. 17. Grodowice, site. 1. Grave 5: a – plan of a burial pit at a depth of 20 cm, b – skeleton's figure with an outline of a burial pit observed during exploration; 1 – silver. Grave 6: skeleton's figure with an outline of a burial pit observed during excavation. Photo by W. Pohorecki

The burial pit was dug into the natural loess subsoil. The bottom was flat and was recorded at 40 cm. The outlines of the burial pit were clearly marked. The fill of the burial pit was non-homogenous, spotted, with dark-brown humus soil mixed with lumps of loess. Within its outline, at a depth of 30-40 cm, well-preserved human bones with a partially damaged skull, with almost no traces of the spine, were discovered.

The deceased was buried head to the west, in a supine position with both hands placed on the left hip. A silver coin was found near the right femur (1).

Anthropological analysis. Undetermined sex, *Juvenis*. Pathological changes and injuries: degenerative changes of lumbal vertebrae (L1); enamel hypoplasia of all teeth.

Artefacts recorded in a grave.

1. Silver coin: Cross denarius with visible but worn surfaces that suggest long circulation.; Numismatic description: CNP 986, CNP VII, 964, 967-998; Chronology acc. to Ch. Kilger ca. 1070-1100 AD. Size: diam. – 12.4 mm. Weight 0.86 g. Cat. No. 4/2005.

Grave 6 (fig. 17) – at a depth of 20 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 136x96 cm was found. The burial pit was dug into the natural loess subsoil. The bottom was flat and was recorded at 45 cm. The outlines of the burial pit were not clearly marked in the east part and were mixed with natural loess subsoil surrounding the grave pit. The full outlines of the burial pit were recorded only when exploring the skeleton. The fill of the burial pit was non-homogenous, largely destroyed by the activity of burrowing animals. At a depth of 30-45 cm well-preserved human bones were discovered partly in nonanatomical order. The deceased was buried presumably head to the west, in a supine position with the arms stretched along the body. The anatomical order of the skeleton was largely disturbed. No artefacts were recorded.

Anthropological analysis. Male (?), *Adultus*. Pathological changes and injuries: osteoma of parietal bone; degenerative diseases of articular surface of vertebrae; plaque of premolars and molars.

Artefacts recorded in a grave. –

Grave 9 (fig. 18) – at a depth of 20 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 152x76 cm was found. The burial pit was dug into the natural loess subsoil. The bottom was flat and was recorded at 30 cm. The outlines of the burial pit were discernible but its features were destroyed due to modern crop cultivation. The fill of the burial pit was dark-brown humus. At a depth of 20-30 cm very poorly preserved human bones were found (only the skull and a few long bones). No traces of constructions made of organic materials were recorded. The deceased was buried head to the east. Due to poor preservation of the skeleton, its position within the burial pit was impossible to reconstruct. By the skull, on the right side, close to the temporal bone a temple-ring (1) was discovered.

Anthropological analysis. Female, *Adultus*. Pathological changes and injuries: caries of first and second molars and second premolars; enamel hypoplasia of all teeth in varying degree; plaque of all teeth in varying degree.

Artefacts recorded in a grave.

1. Silver temple ring with decoration in the form of parallel grooves on the loops, type IIIc acc. to K. Musianowicz. Size: inner diam. – 9 mm, outer diam. – 14x15 mm, thickness – 2 mm. Cat. No. 7/2005.

Grave 10 (fig. 19) – at a depth of 20 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 254x68 cm was found. Its south-west part was badly destroyed due to ploughing (plan a). The burial pit was dug into the natural loess subsoil. Its flat bottom was recorded at 60 cm. The outlines of the burial pit were discernible. The fill of the burial pit was light-brown humus. Above the burial pit's bottom (plan b) rectangular in shape structure, which most likely was the remains of a decomposed coffin made of organic material, probably of wood, was recorded. At a depth of 45-60 cm very well-preserved human bones in a non-anatomical order in the upper part were found. The deceased was buried head to the south-west, in a supine position with the arms presumably stretched along the body. By the left tibia a temple-ring (1) was discovered.

Anthropological analysis. Female, *Adultus*. Pathological changes and injuries: caries of first and second molars and second premolars; enamel hypoplasia of all teeth; plaque of premolars and molars.

Artefacts recorded in a grave.

1. Temple ring made of a copper alloy, type III acc. to K. Musianowicz. Size: inner diam. – ca. 11x9 mm, outer diam. – ca. 15x13 mm, thickness – 1.6 mm. Cat. No. 5/2005.

Grave 12 (fig. 18) – at a depth of 20 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 210x94 cm was found. The top was badly destroyed due to ploughing. The burial pit was dug into the natural loess subsoil. The bottom was flat and was recorded at 30 cm. The outlines of the burial pit were discernible but feature was destroyed due to activity of burrowing animals.

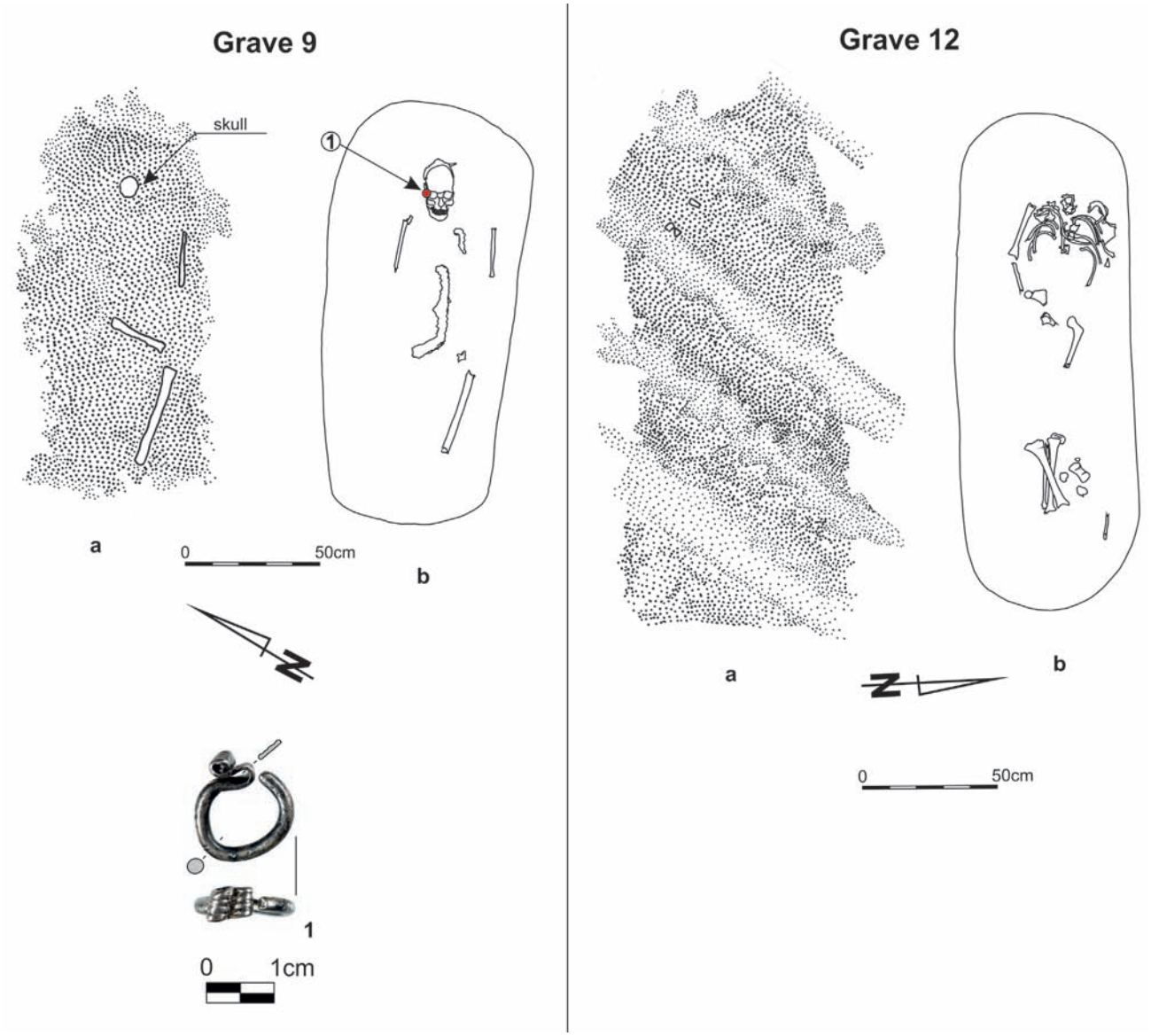

Fig. 18. Grodowice, site 1. Grave 9: a – plan of a burial pit at a depth of 20 cm, b – skeleton's figure with an outline of a burial pit observed during exploration; 1 – silver. Grave 12: a – plan of a burial pit at a depth of 20 cm, b – skeleton's figure with an outline of a burial pit observed during excavation. Photo: W. Pohorecki

The fill of the burial pit was light-brown humus. At a depth of 25-30 cm very poorly preserved human skelet, with no skull. Pelvis and most of vertebrae. Long bone were quite good preserved. No traces of constructions made of organic materials were recorded. The deceased was buried head to the west. Although the skeleton was poorly preserved it may be assumed that the deceased was buried in a supine position. No artefacts were found.

Anthropological analysis. undetermined sex, *Infans II/Juvenis*. Pathological changes and injuries: enamel hypoplasia of canines and premolars; plaque of incisors.

Artefacts recorded in a grave. –

Grave 20 (fig. 20) – at a depth of 40 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 22x90 cm was found. The burial pit was dug into the natural loess subsoil. The bottom was flat and was recorded at 65 cm. The outlines of the burial pit were discernible. The fill of the burial pit was homogenous with brown humus. While exploring the burial pit's shape it turned out to be strongly elongated oval in shape in west-east axis. At a depth of 50-65 cm very well-preserved human bones were found. The deceased was buried head to the east, in a supine position with the arms

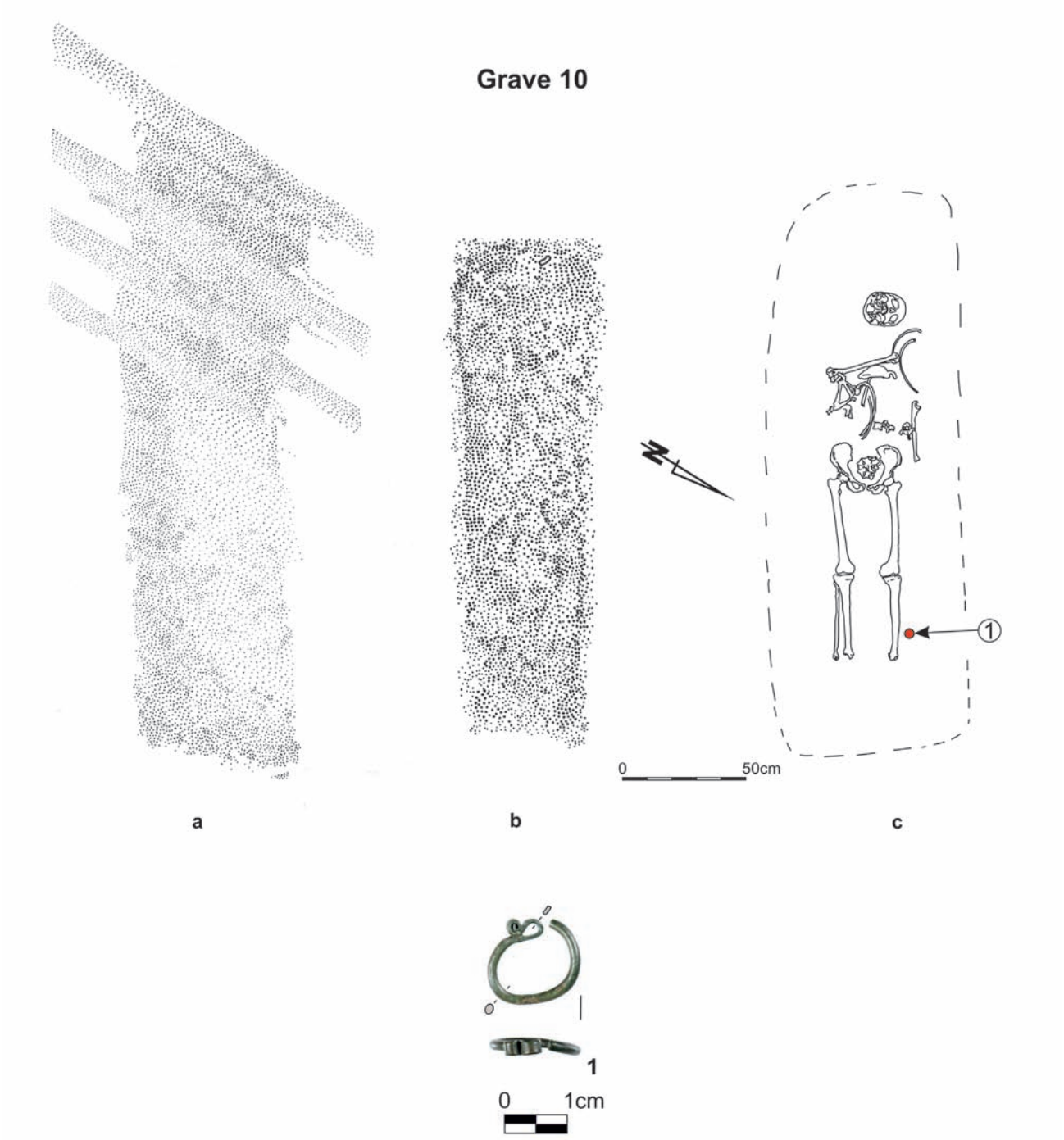

Fig. 19. Grodowice, site. 1. Grave 10: a – plan of a burial pit at a depth of 20 cm, b – plan of a burial pit at a depth of 40 cm, c – skeleton's figure with an outline of a burial pit observed during excavation; 1 – copper or copper alloy. Photo: W. Pohorecki

stretched along the body. The left leg was slightly bent at the knee. No artefacts were found.

Anthropological analysis. Male, *Adultus*. Pathological changes and injuries: healed, symmetrical fractures of the shafts of ulnar bones; degenerative changes of phalangs; enamel hypoplasia of all teeth; plaque of molars.

Artefacts recorded in a grave. –

Grave 23 (fig. 21) – at a depth of 20 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 212x90 cm was found. The burial pit was dug into the natural loess sub-

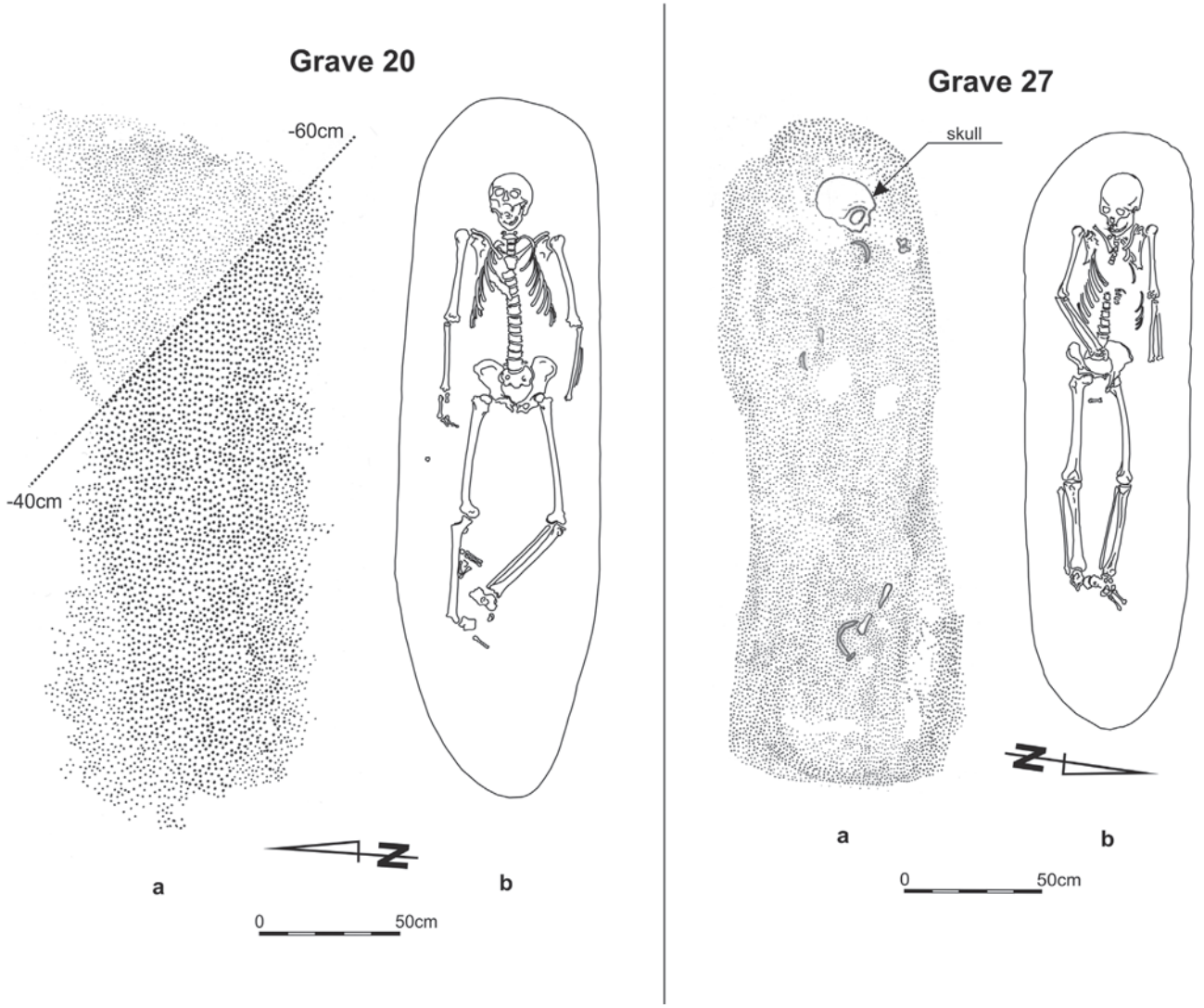

Fig. 20. Grodowice, site 1. Grave 20: a – plan of a burial pit at a depth of 40/60 cm, b – skeleton's figure with an outline of a burial pit observed during exploration. Grave 27: a – plan of a burial pit at a depth of 70 cm, b – skeleton's figure with an outline of a burial pit observed during exploration

soil, destroying older feature 11. The bottom was flat and was recorded at 65 cm. The outlines of the burial pit were poorly discernible, in the west part mixed with feature 11. The fill of the burial pit was homogenous with light-brown humus. While exploring burial pit's shape turned out to be much smaller. Its outline in the top part was 152x80 cm. At a depth of 50-65 cm well-preserved human bones in nonanatomical order were found. The deceased was presumably buried head to the west in a supine position. By the south-east border of the burial pit at a depth of 65 cm temple ring (1) was found.

Anthropological analysis. Undetermined sex, *Infans II/Juvenis*. Pathological changes and injuries: –

Artefacts recorded in a grave.

1. Temple ring made of silver, type III acc. to K. Musianowicz. Size: inner diam. 10x11 mm, outer diam. – 15x16 mm, thickness – 2 mm. Weight: 1.96 g. Cat. No. 6/2005.

Grave 26 (fig. 22) – at a depth of 40 cm from the present day ground surface a burial pit rectangular in plan, strongly elongated along an east-west axis, and size 199x45 cm (plan a) was found. Its outline has changed at a depth of 70 cm. The burial pit was rectangular in plan with rounded corners, oriented along an east-west axis and size 202x70 cm (plan b). The burial pit was dug into the natural loess subsoil, destroying older feature 29.

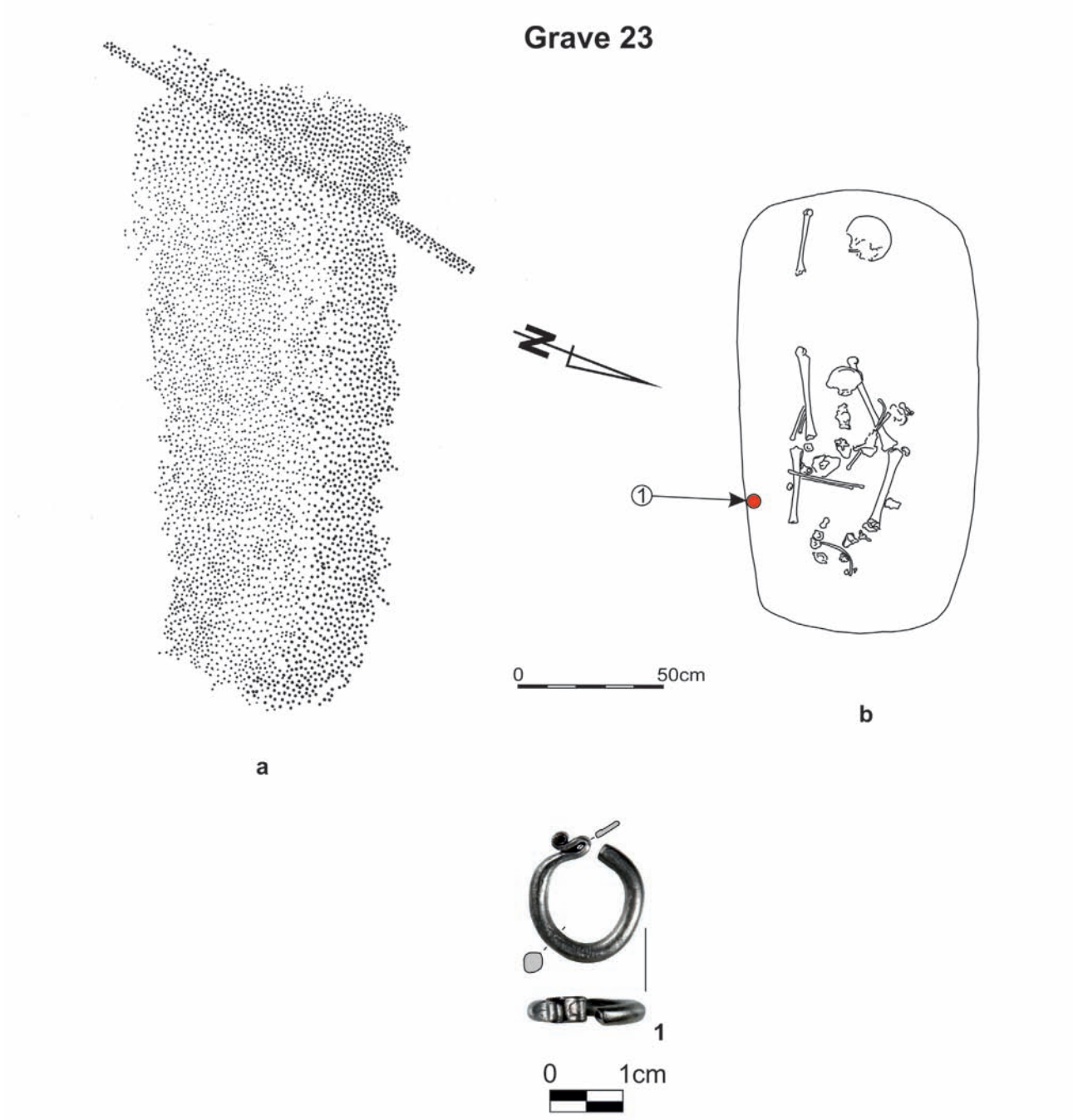

Fig. 21. Grodowice, site 1. Gave 23: a – plan of a burial pit at a depth of 20 cm, b – skeleton's figure with an outline of a burial pit observed during exploration; 1 – silver. Photo by W. Pohorecki

The bottom was flat and was recorded at 85 cm. The fill of the burial pit was non-homogenous with dark-brown and grey humus. At a depth of 70-85 cm very well-preserved human bones were found. The deceased was buried head to the west, in a supine position with the arms stretched along the body. No artefacts were found.

Anthropological analysis. Male (?), *Maturus*. Pathological changes and injuries: degenerative changes od vertebrae, mostly of lumbar vertebrae, ribs; enamel hypoplasia of teeth from right maxilla; plaque on molars and premolars.

Artefacts recorded in a grave. –

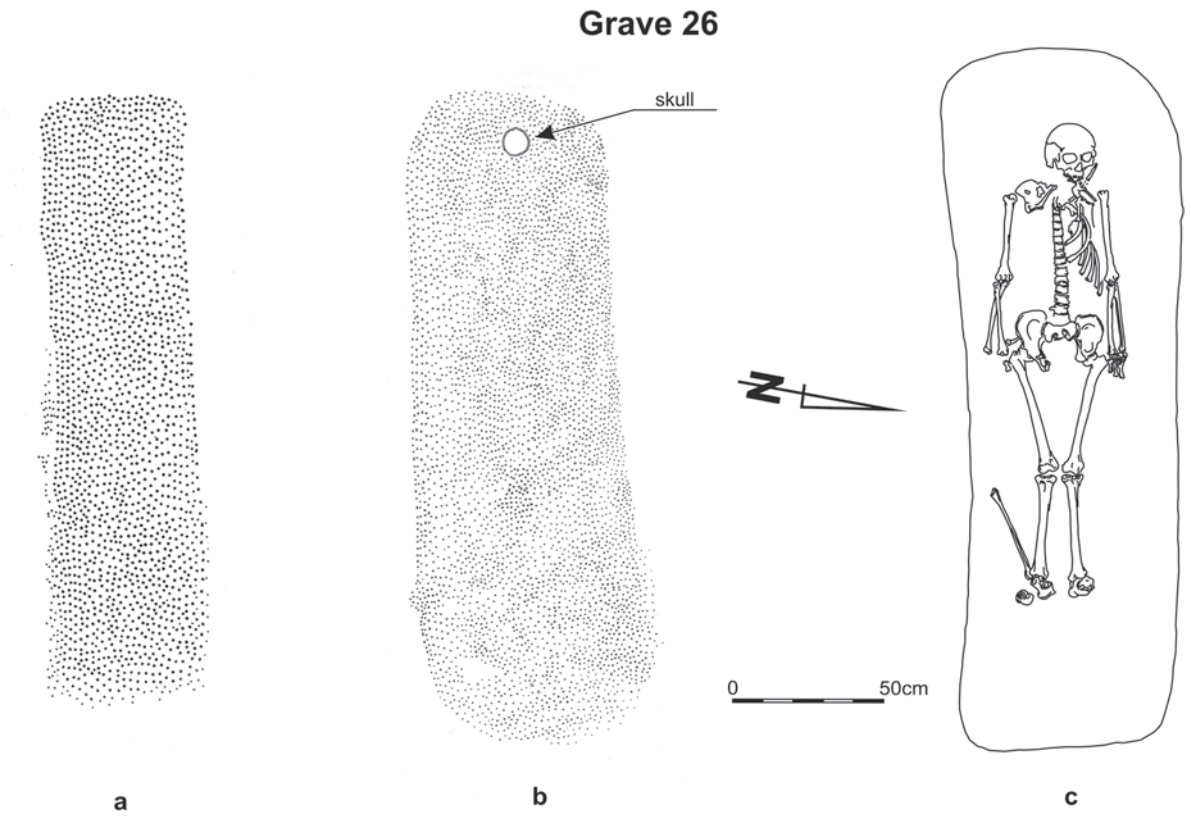

Fig. 22. Grodowice, site 1. Grave 26: a – plan of a burial pit at a depth of 40 cm, b – plan of a burial pit at a depth of 70 cm, c – skeleton's figure with an outline of a burial pit observed during excavation

Grave 27 (fig. 20) – at a depth of 70 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 168x72 cm was found. Its outline has changed at a depth of 70 cm. The burial pit was dug into the natural loess subsoil, destroying older features 28 and 29. The bottom was flat and was recorded at 95 cm. The fill of the burial pit was non-homogenous with dark-brown and grey humus with lumps of loess. By the border of the fill darker layer of dark-grey humus, which most likely was the remains of decomposed coffin made of organic material, probably of wood, was recorded. At a depth of 70-95 cm well-preserved human bones were found. The deceased was buried head to the west, in a supine position with right hand on the pelvis and left hand alongside the body. No artefacts were found.

Anthropological analysis. Female, *Maturus*. Pathological changes and injuries: degenerative changes od vertebrae, sternum, right distal pedicle of radius ones, tibias.

Artefacts recorded in a grave. –

Grave 34 (fig. 23) – at a depth of 40 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 172x54 cm was found. While exploring of a skeleton burial pit was smaller 127x47 cm. The burial pit was dug into the natural loess subsoil. The bottom was flat and was recorded at 60 cm. The outlines of the burial pit were discernible. The fill of the burial pit was homogenous with light-brown humus. At a depth of 45-60 cm well-preserved human bones were found. The deceased was buried head to the west, in a supine position presumably with hands stretched along the body. No artefacts were found.

Anthropological analysis. Undetermined sex, *Infans I*. Pathological changes and injuries: –

Artefacts recorded in a grave. –

Grave 35 (fig. 23) – at a depth of 20 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 90x34 cm was found. The burial pit was dug into the natural loess sub-

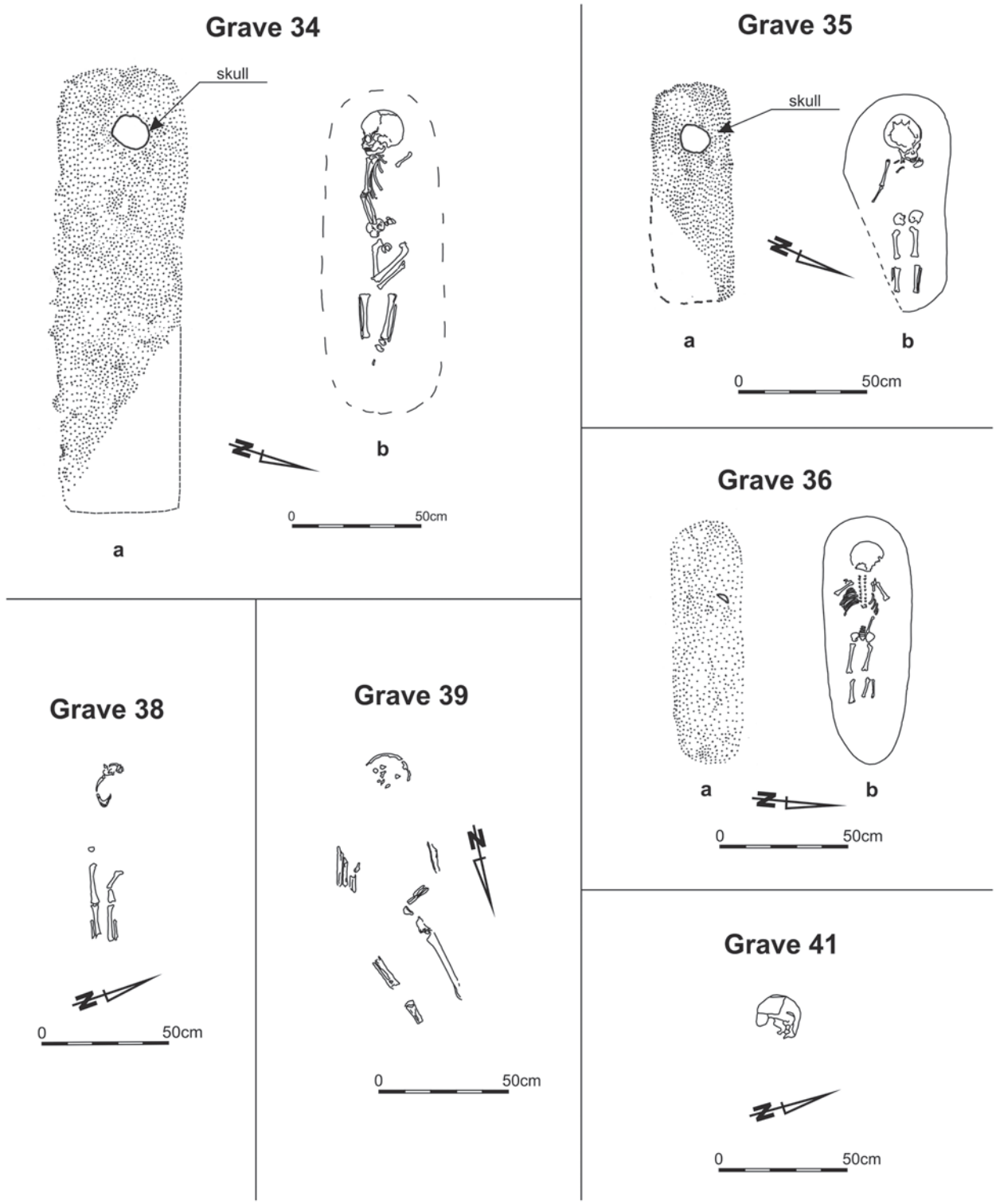

Fig. 23. Grodowice, site 1. Grave 34: a – plan of a burial pit at a depth of 40 cm, b – skeleton's figure with an outline of a burial pit observed during exploration. Grave 35: a – plan of a burial pit at a depth of 20 cm, b – skeleton's figure with an outline of a burial pit observed during exploration. Grave 36: a – plan of a burial pit at a depth of 20 cm, b – skeleton's figure with an outline of a burial pit observed during exploration. Grave 38: skeleton's figure. Grave 39: skeleton's figure. Grave 41: skeleton's figure

soil. The bottom was flat and was recorded at 40 cm. The fill of the burial pit was non-homogenous with brown humus and lumbs of loess. At a depth of 20-40 cm human bones were found (skull, long bones, and some elements of pelvis). The deceased was buried head to the west, in a supine position

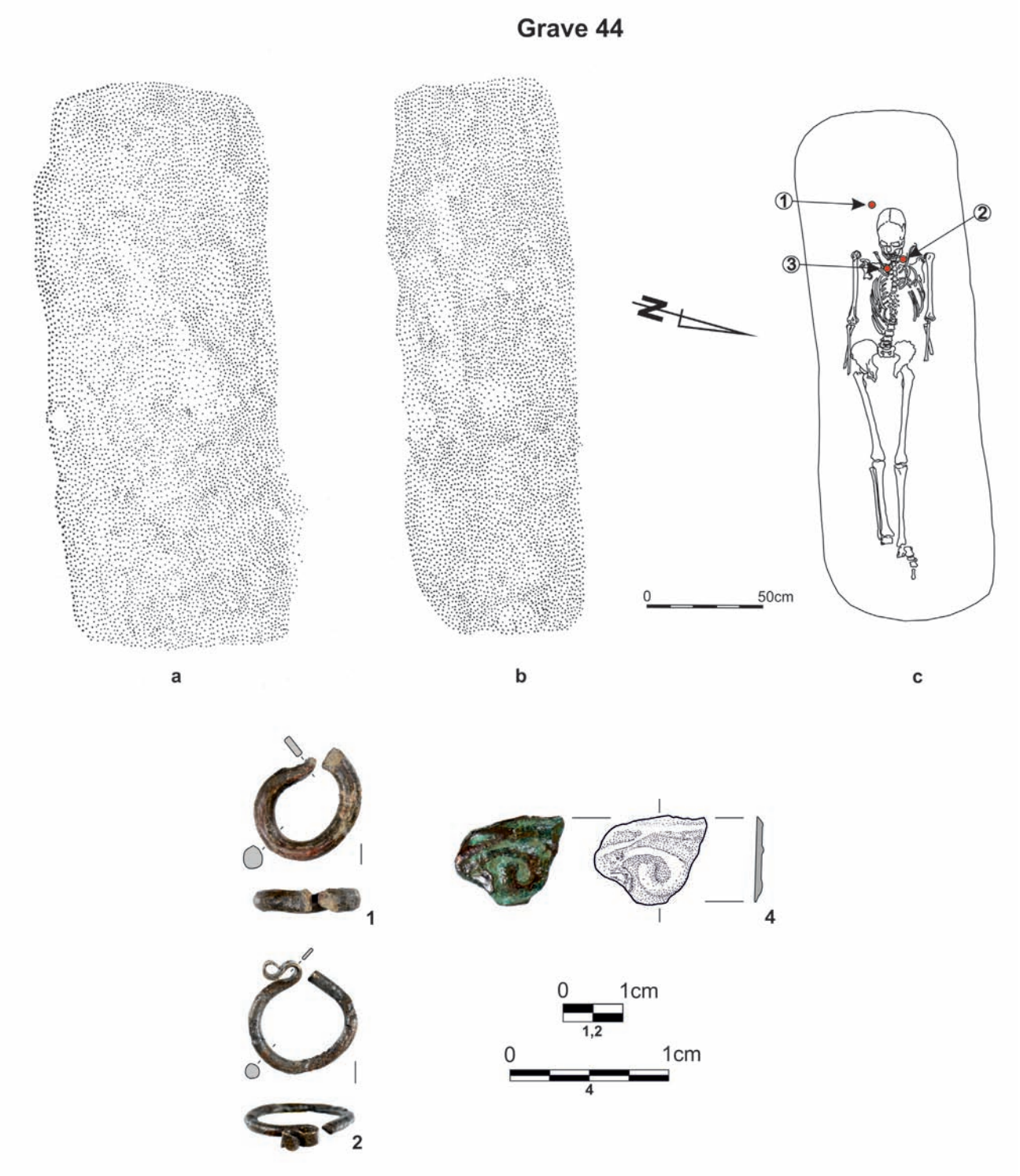

Fig. 24. Grodowice, site 1. Grave 44: a – plan of a burial pit at a depth of 30 cm, b – plan of a burial pit at a depth of 40 cm, c – skeleton's figure with an outline of a burial pit observed during exploration; 1 – brass, 2 – copper or copper alloy, 4 – brass. Photo: W. Pohorecki

with hand presumably stretched along the body. No artefacts were found.

Anthropological analysis. Undetermined sex, *Infans I*. Pathological changes and injuries: –

Artefacts recorded in a grave. –

Grave 36 (fig. 23) – at a depth of 20 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 96x36 cm was found. The burial pit was dug into the natural loess subsoil. The

bottom was flat and was recorded at 35 cm. The fill of the burial pit was homogenous with light-brown humus. At a depth of 25-35 cm quite well-preserved human bones were found. The deceased was buried head to the west, in a supine position with hands presumably stretched along the body. No artefacts were found.

Anthropological analysis. Undetermined sex, *Infans I*. Pathological changes and injuries: –

Artefacts recorded in a grave.

Grave 38 (fig. 23) – at a depth of 55 cm from the present day ground surface poorly preserved human bones were found. The deceased was buried head to the west, presumably in a supine position. The outlines of the burial pit were indiscernible. Skeleton was discovered in the top of an older feature 33. No artefacts were found.

Anthropological analysis. Undetermined sex, *Infans I*. Pathological changes and injuries: –

Artefacts recorded in a grave. –

Grave 39 (fig. 23) – at a depth of 50-60 cm from the present day ground surface poorly preserved human bones were found (skull and few long bones). The deceased was buried head to the south, presumably in a supine position. The outlines of the burial pit were indiscernible. No artefacts were found.

Anthropological analysis. Undetermined sex, *Senilis*. Pathological changes and injuries: –

Artefacts recorded in a grave. –

Grave 41 (fig. 23) – at a depth of 40 cm from the present day ground surface poorly preserved skull was found. The outlines of the burial pit were indiscernible. No artefacts were found.

Anthropological analysis. Undetermined sex, *Infans I*. Pathological changes and injuries: –

Artefacts recorded in a grave. –

Grave 44 (fig. 24, 25, 26) – at a depth of 30 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 242x88 cm (plan a) was found. The outlines of the burial pit were well discernible; only in the south part the outlines were indiscernible. The burial pit was a little smaller at a depth of 40 cm (237x79 cm), more regular, rectangular in plan with more discernible outlines (plan b). The burial pit was dug into the natural loess subsoil destroying an older feature 76. From the north part, at its longer side, burial pit adjoined a feature 51. The bottom was flat and was recorded at 85 cm. The fill of the burial pit was homogenous with dark-brown humus. At a depth of 65-80 cm very well-preserved human bones were found. The deceased was buried head to the west, in a supine position with hands stretched along the body. Two temple rings (1-2) were found; one of them was placed by the skull to the left of the temple (1), the other one, which was found during sieving (2), probably lied by the right temple. A coil (3) composed of a variety of beads (50 intact or slightly damaged beads made of glass and 2 carnelian, 1 crystal rock, as well as 46 fragments of beads), scattered around the clavicles and cervical vertebrae of the deceased were found as well. Sieving the fill of grave produced a small fragment of an object made of copper alloy (4).

Anthropological analysis. Female, *Adultus*. Pathological changes and injuries: enamel hypoplasia of all teeth (strong on incisors, canines, premolars); caries of second molars of maxilla; plaque.

Artefacts recorded in a grave.

1. Lead temple ring, type III acc. to K. Musianowicz. Size: inner diam. – 8x10 mm, outer diam. – 16x18 mm, thickness – 3 mm. Cat. No. 1/2006

2. Copper or copper alloy temple ring, decorated with punch ornament on the hoop, type III acc. to K. Musianowicz. Size: inner diam. – 11x12 mm, outer diam. – 17x18 mm, thickness – 2 mm. Cat. No. 2/2006.

3. Beads – 50 intact or slightly damaged beads made of glass and carnelian, as well as 46 fragments of beads. The beads can be divided into several groups with regard to material they were produced and their shape:

• glass beads:

a. Conical beads – 18 intact, 17 fragments. Green beads made of clear glass with rough, porous and ground surfaces with use of winding technique. Surfaces are covered with opalescent corrosion with thin beige layer. Size: bodies diam. – 0.5-1.0 cm, height – 0.5-1.0 cm, openings diam. – 0.1-0.3 cm, facet thickness – 0.1-0.3 cm. Cat. No. 1/2005 (fig. 25:a).

b. Flat-spherical beads – 12 intact and two fragments. The beads can be divided into four subgroups with regard colour and type of decoration:

– brown-opaque, eight intact (five big, three small) and two fragments. Decorated with

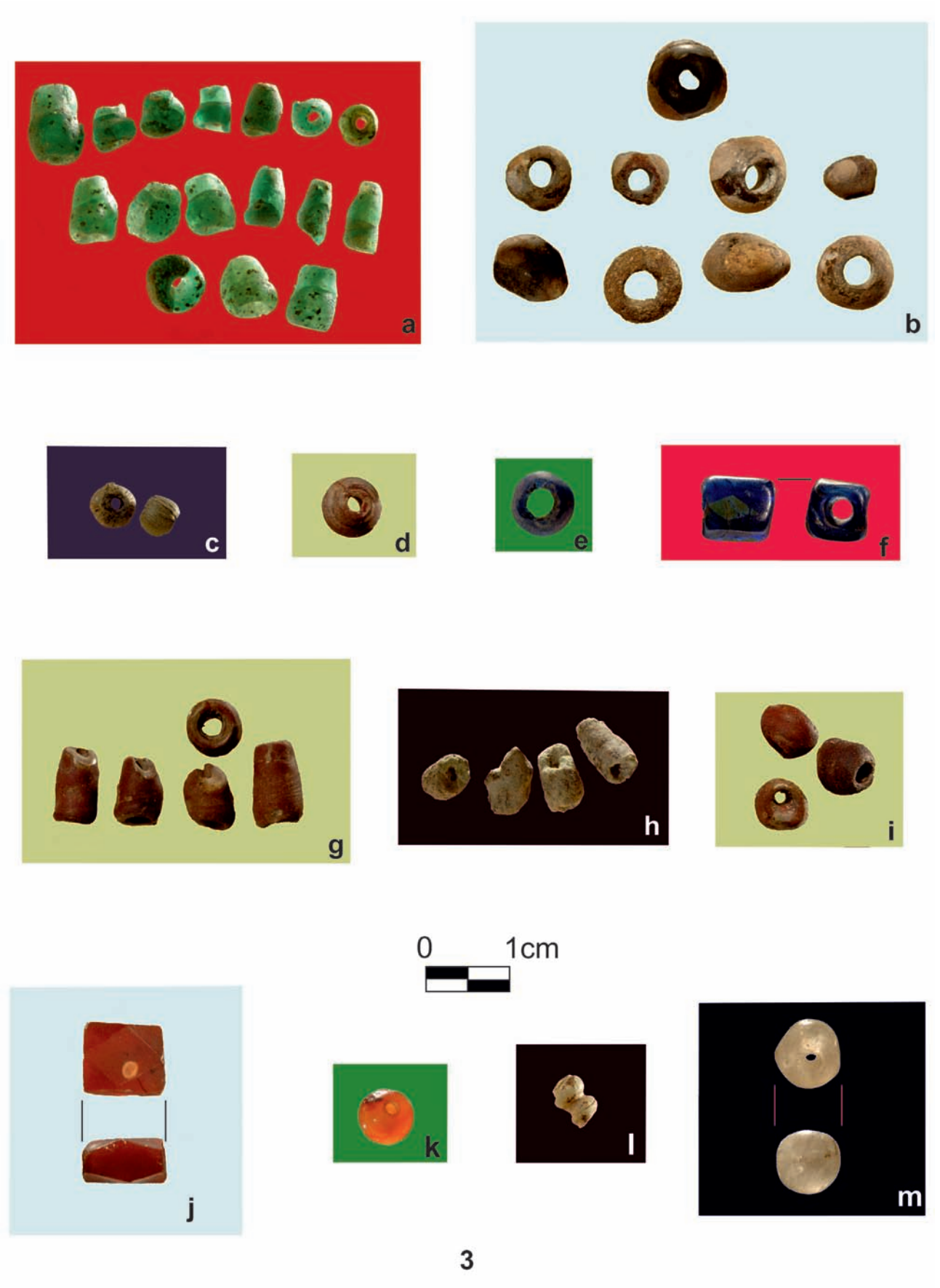

Fig. 25. Grodowice, site 1. Beads from grave 44: 1-9, 12 – glass, 10, 11 – carnelian, 13 – rock crystal. Photo: J. Soida

Fig. 26. Grodowice, site 1. The reconstructed coil from grave 44. Photo: J. Soida

three lemon yellow protrusions. Made presumably with winging technique. Surfaces covered with grey layer of corrosion. Size: bodies diam. – 0.8-1.1 cm, height – 0.5-0.7 cm, openings diam. – 0.3-0.4 cm, facet thickness – 0.25-0.45 cm (fig. 25:b).

– blue-clear – one specimen, undecorated. Surface flat, porous and ground. Technique undefined. Size: bodies diam. – 0.65 cm, height – 0.5 cm, openings diam. – 0.15 cm, facet thickness – 0.15 cm (fig. 25:e).

– liver-red – one opaque glass bead flat, porous and ground. Technique undefined. Size: bodies diam. – 0.75 cm, height – 0.3 cm, openings diam. – 0.2-0.3 cm, facet thickness – 0.25 cm (fig. 25:d).

– citron-yellow – two beads made of opaque glass with ground rough surface. Surface covered with brown-beige patine. Undefined technique. Size: bodie diam. – 0.6 cm, height – 0.45 cm, openings diam. – 0.15 cm, facet thickness – 0.1 cm (fig. 25:c).

c. Spherical – two presumably faience of undefined colour beads. Strongly ground with rough surface, very fragile. Undefined technique. Size: bodie diam. – 0.6-0.8 cm, height – 0.6-0.65 cm, openings diam. – 0.1-0.2 cm.

d. Cylindrical – 10 beads, which can be divided into 2 subgroups:

– liver-red colour beads. Six specimens with rough, ground, covered with thin layer of brown patina surface. Undecorated. Technique

undefined. Size: bodie diam. – 0.55-0.7 cm, height – 0.8-1.1 cm, openings diam. – 0.2-0.3 cm, facet thickness – 0.2-0.3 cm (fig. 25:g).

– four presumably faience beads of undetermined colour. Strongly ground with rough surface, very fragile. Undefined technique. Size: bodies diam. – 0.5-0.6 cm, height – 0.9-1.0 cm, openings diam. – 0.2 cm, facet thickness – 0.2 cm (fig. 25:h).

e. Barrel-shaped – three beads made of transparent brown glass, decorated with cylindrical irregular black lines. Rough, ground surface. Undefined technique. Size: bodies diam. – 0.7 cm, height – 0.6 cm, openings diam. – 0.1-0.2 cm, facet thickness – 0.15 cm (fig. 25:i).

f. Bead with an almost rectangular cuboid shape, made of blue glass of flat, plain, ground surfaces, whose four walls were ornamented with diamonds, either painted yellow or made of gold foil. Size: bodie diam. – 0.75 cm, height – 0.95 cm, openings diam. – 0.2 cm, facet thickness – 0.2 cm (fig. 25:f).

g. Bilobed – one bead made of yellow glass. Ground surface covered with light-brown patine. Undecorated. Undefined technique. Size: bodie diam. – 0.4-0.5 cm, height – 0.6 cm, openings diam. – 0.1 cm (fig. 25:l).

• Carnelian – two specimens. The beads can be divided into two types with regard to colour and shape:

a. Prism-shaped – one liver-red bead with flat, plain, glossy surfaces. Technique undefined. Size: bodie diam. – 0.85 cm, height – 1.0 cm, openings diam. – 0.1 cm (fig. 25:j).

b. Spherical – one light-orange bead with flat, plain and glossy surfaces. Technique undefined. Size: bodie diam. – 0.7 cm, height – 0.6 cm, openings diam. – 0.15 cm (fig. 35:k).

• Rock crystal – one specimen (fig. 25:m).

a. Spherical transparent bead with rough and glossy surface. Technique undefined. Size: bodie diam. – 0.95 cm, height – 0.8 cm, openings diam. – 0.15 cm.

4. Small fragment of an object made of copper alloy decorated on one side with relief ornamentation. The poor preservation of the artefact makes its identification difficult. It cannot be excluded that this is a fragment of a bend-shaped decorated finger-ring, The discussed artefact may also be a fragment of a pendant. Cat. No. 7/2006.

Grave 46 (fig. 27) – at a depth of 20 cm from the present day ground surface a elongated along an east-west axis, irregular burial pit and size 148x92 cm was found. The outlines of the burial pit were indiscernible due to the activity of burrowing animals. During exploration the burial pit was irregular in plan and size 148x65 cm. The burial pit was dug into the natural loess. The bottom was flat and was recorded at 40 cm. The fill of the burial pit was non-homogenous with dark-brown and grey humus. At a depth of 30-40 cm poorly preserved human bones were found. The deceased was buried head to the west, in a supine position with hands presumably stretched along the body. No artefacts were found.

Anthropological analysis. Undetermined sex, *Infans I*. Pathological changes and injuries: –

Artefacts recorded in a grave. –

Grave 48 (fig. 27) – at a depth of 40 cm from the present day ground surface a skull was found. The outlines of the burial pit were indiscernible. No artefact were found.

Anthropological analysis. Undetermined sex, *Infans I*. Pathological changes and injuries: –

Artefacts recorded in a grave. –

Grave 49 (fig. 28) – at a depth of 55 cm from the present day ground surface a near-rectangular burial pit with rounded corners, oriented along an east-west axis was found. The feature was a little bit dilated in the east part. Its size was 274x118 cm. The burial pit was dug into the natural loess destroying an older feature 76. The bottom was flat and was recorded at 70 cm. The fill of the burial pit was non-homogenous with grey-brown humus with lumps of yellow loess. At a depth of 55-70 cm well-preserved human bones were found. The deceased was buried head to the west, in a supine position with hands stretched along the body. Upper part of the skeleton was in nonanatomical order. No artefact were found.

Anthropological analysis. Male, *Adultus*. Pathological changes and injuries: enamel hypoplasia of canines and premolars, plaque of incisors and molars.

Artefacts recorded in a grave. –

Grave 50 (fig. 29) – at a depth of 60 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along

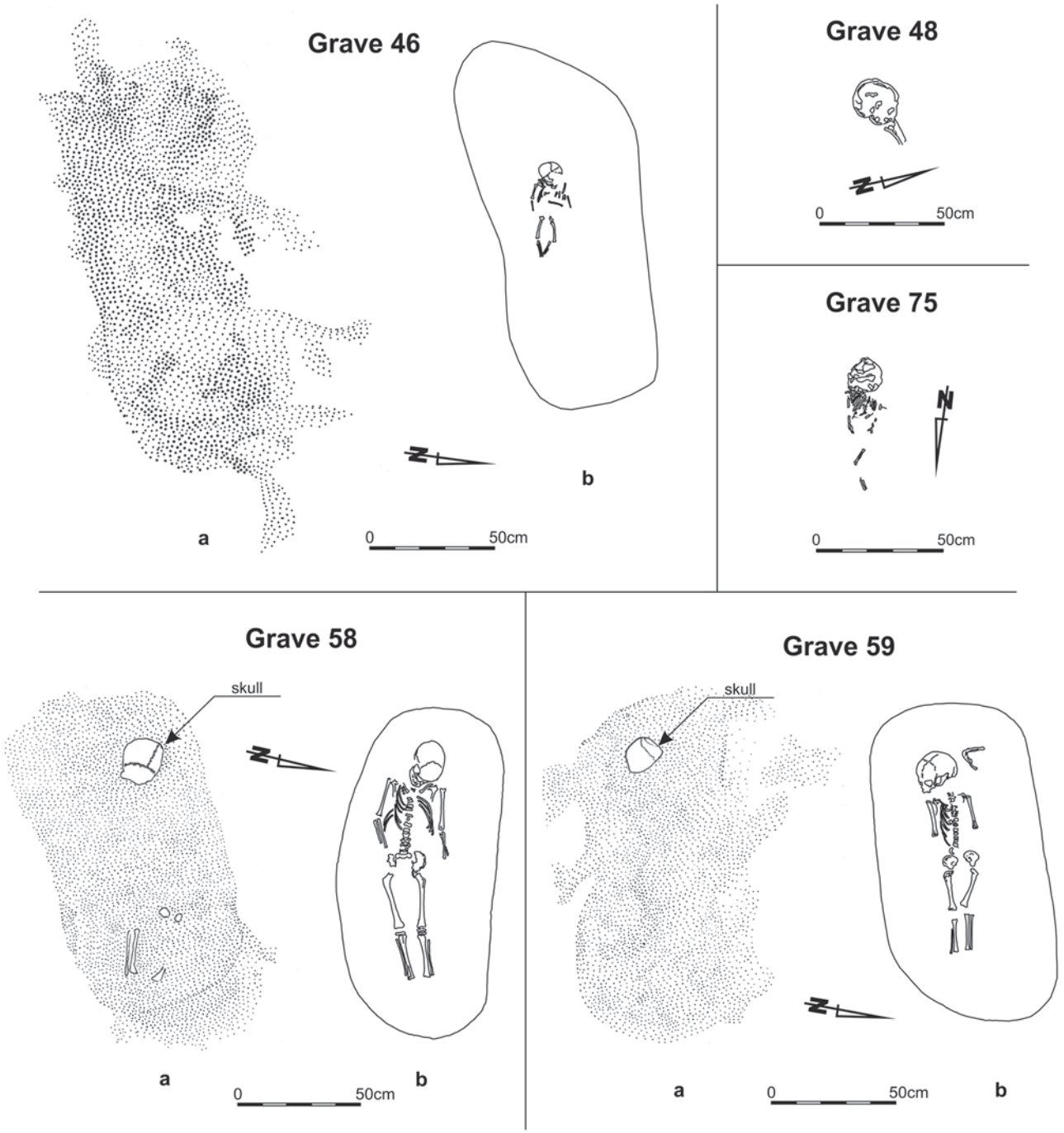

Fig. 27. Grodowice, site 1. Grave 46: a – plan of a burial pit at a depth of 20 cm, b – skeleton's figure with an outline of a burial pit observed during exploration. Grave 48: skeleton's figure. Grave 58: a – plan of a burial pit at a depth of 55 cm, b – skeleton's figure with an outline of a burial pit observed during exploration. Grave 59: a – plan of a burial pit at a depth of 70 cm, b – skeleton's figure with an outline of a burial pit observed during exploration. Grave 75: skeleton's figure

an east-west axis, and size 224x104 cm was found. The burial pit was dug into the natural loess destroying an older feature 105. The outlines of the burial pit were discernible. The bottom was flat and was recorded at 70 cm. The fill of the burial pit was homogenous with dark-brown humus. At a depth of 60-70 cm very well-preserved human bones were found. The deceased was buried head to the west, in a supine position with right hand on the pelvis and left hand stretched along the body. Four temple

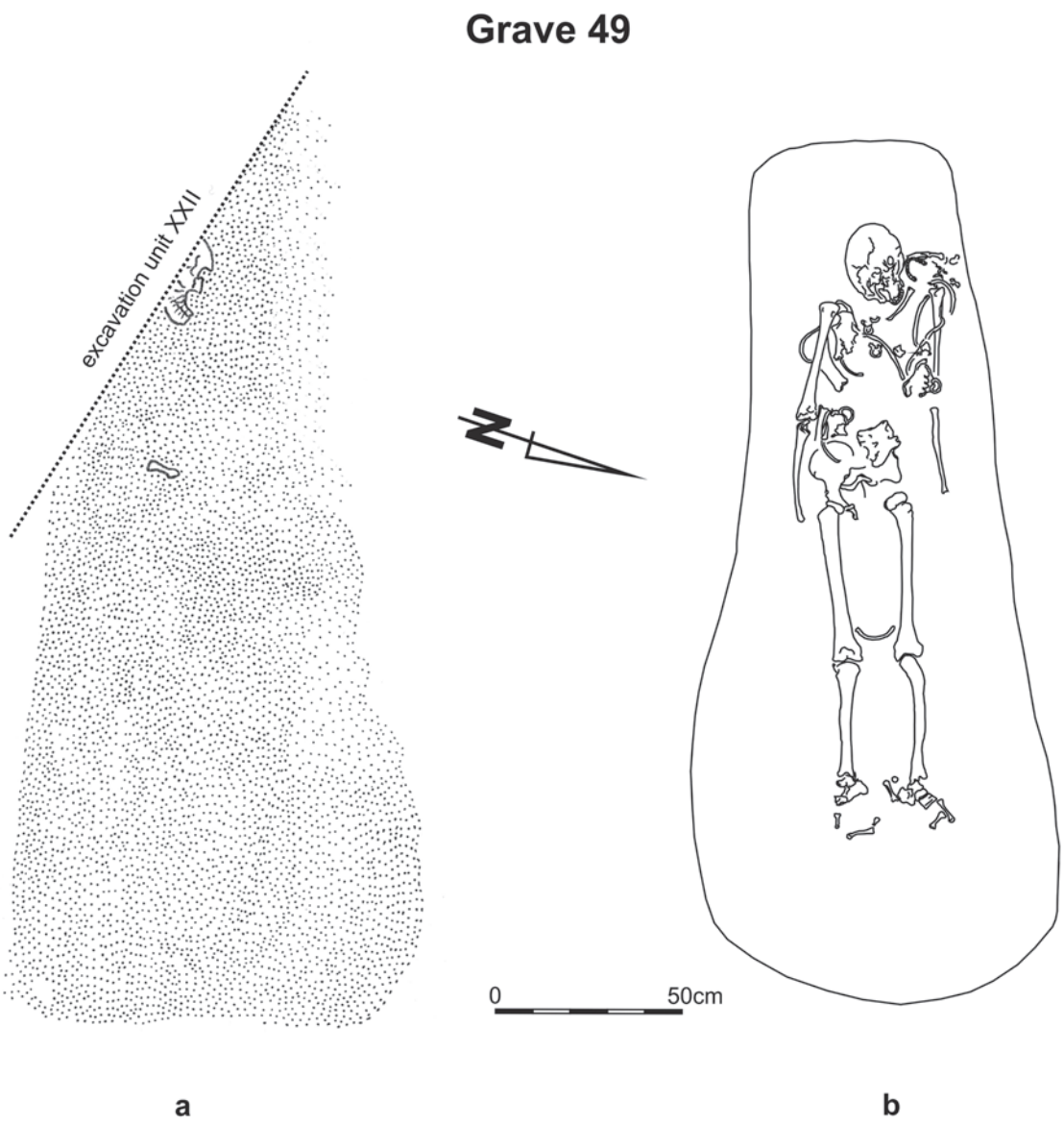

Fig. 28. Grodowice, site 1. Grave 49: a – plan of a burial pit at a depth of 20 cm, b – skeleton's figure with an outline of a burial pit observed during exploration

rings were found by the skull, three of them were placed to the right of the temple (1-3) and one to the left of the temple (4). Next to the phalanxes of the right hand a finger ring was found (5).

Anthropological analysis. Female, *Adultus/ Maturus*. Pathological changes and injuries: few poorly pronounced osteophytes; cribra orbitalia, i.e. porotic hyperostosis (both orbital bones); caries of M1 (both maxilla and jaw), M2 of jaw; plaque of all teeth in varying degree.

Artefacts recorded in a grave.

1. Brass temple ring, type III acc. to K. Musianowicz. Size: inner diam. – 10x12 mm, outer diam. – 17x20 mm, thickness – 3 mm. Cat. No. 20/2008.

2. Brass temple ring, type III acc. to K. Musianowicz. Size: inner diam. – 8x9 mm, outer diam. – 13x15 mm, thickness – 2 mm. Cat. No. 21/2008.

3. Brass temple ring type III acc. to K. Musianowicz. Size: inner diam. – 11 mm, outer diam. – 16x20 mm, thickness – 3 mm. Cat. No. 22/2008.

4. Copper temple ring, type III acc. to K. Musianowicz. Size: inner diam. – 11x12 mm, outer diam. – 17x21 mm, thickness – 3 mm. Cat. No. 23/2008.

5. Finger ring made of a brass rod of oval section. The thinned ends of the hoop overlap, and the inner diameter is 1.9 mm, thickness – 2-3.5 mm. Cat. No. 24/2008.

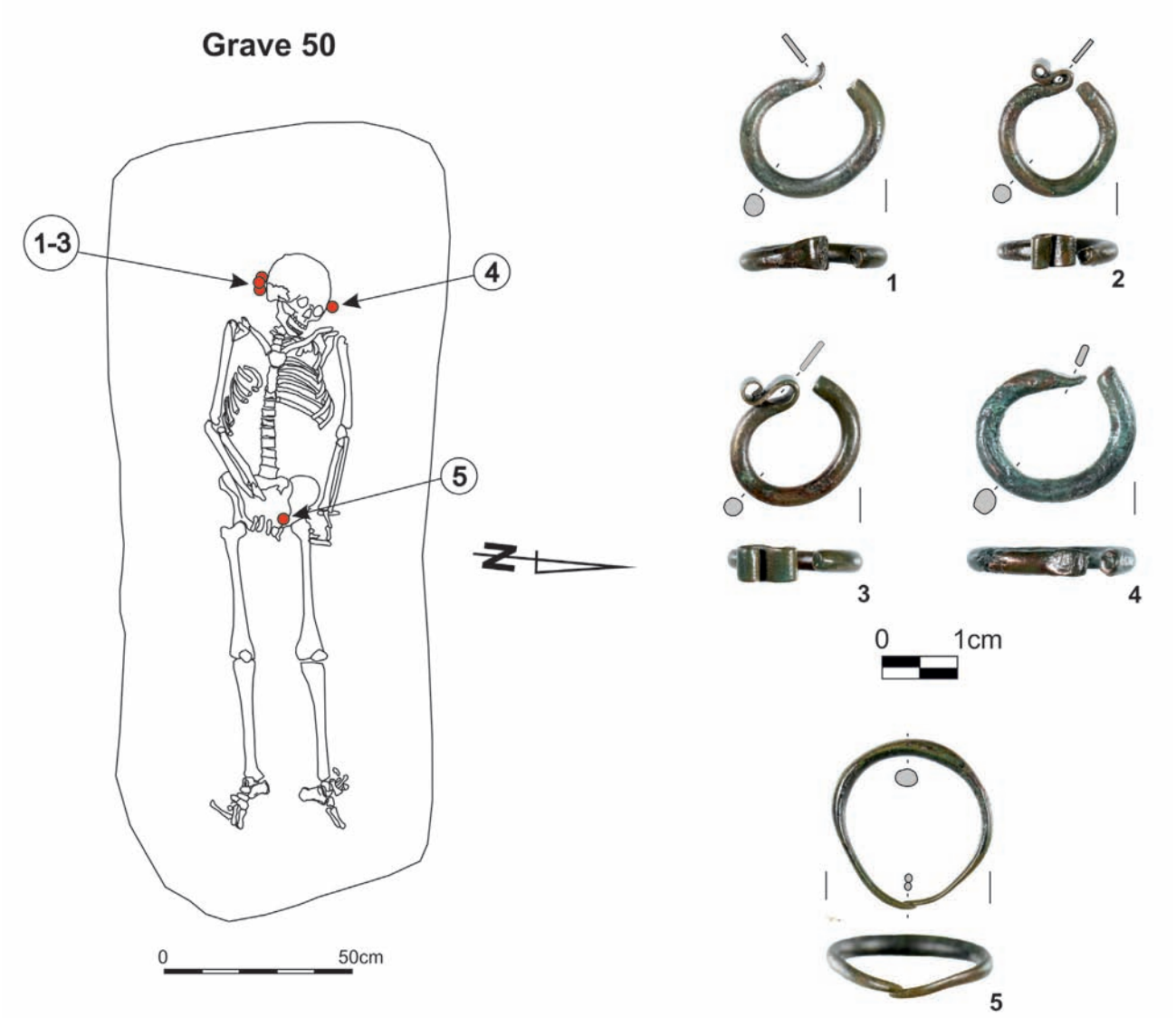

Fig. 29. Grodowice, site 1. Grave 50: skeleton's figure and an outline of a burial pit observed during exploration; 1-3, 5 – brass, 4 – copper or copper alloy

Grave 51 (fig. 30) – at a depth of 55 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 252x76 cm was found. While exploring burial pit turned out to be a little narrower (243x72 cm). The burial pit was dug into the natural loess destroying an older feature 76. South part of the burial pit adjoined at its longer side to a grave 44. The outlines of the burial pit were discernible. The bottom was flat and was recorded at 80 cm. The fill of the burial pit was homogenous with light-brown humus. At a depth of 65-80 cm very well-preserved human bones were found. Skelet partly in nonanatomical order. The deceased was buried head to the west, in a supine position with hands stretched along the corpse. No artefacts were found.

Anthropological analysis. Female, *Adultus*. Pathological changes and injuries: enamel hypoplasia of C, I1, I2; plaque of all teeth in varying degree; degeneration changes of vertebrae, metacarpus, and metatarsus.

Artefacts recorded in a grave. –

Grave 52 (fig. 31) – at a depth of 90 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 214x102 cm (plan a) was found. The north border of the burial pit adjoined an older feature 33. The fill of the burial pit was homogenous with grey humus. The burial

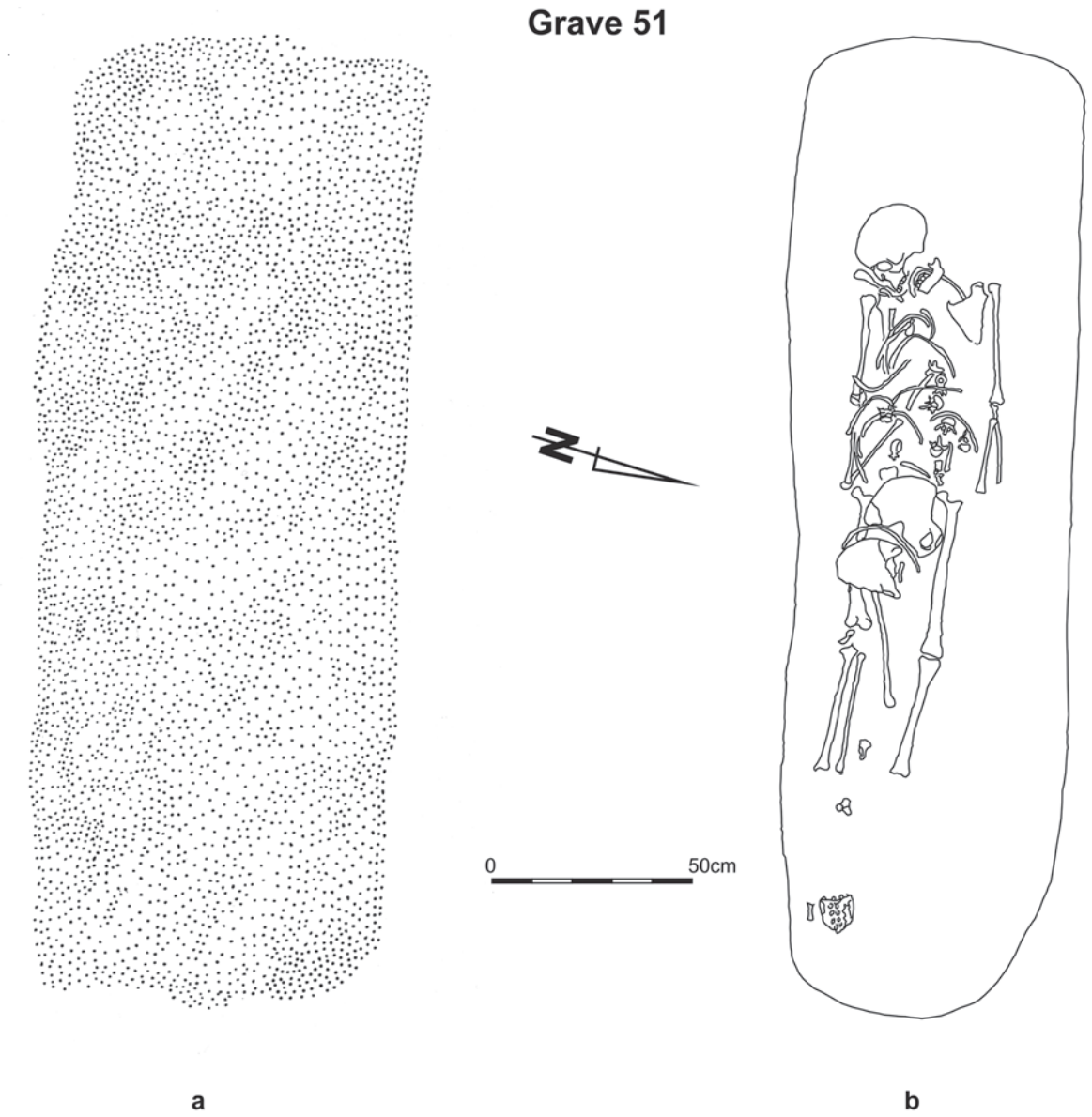

Fig. 30. Grodowice, site 1. Grave 51: a – plan of a burial pit at a depth of 55 cm, b – skeleton's figure with an outline of a burial pit observed during exploration. Photo: W. Pohorecki

pit was dug into the natural loess. The bottom was flat and was recorded at 120 cm. At a depth of 110 cm within the light grey and grey fill of the burial pit traces revealed evidence for construction of an organic nature, presumably a coffin – i.e., a dark-grey humus layer approximately rectangular in plan (plan b). At a depth of 110-120 cm poorly preserved human bones (skull, femur bones and one tibia) were found. The deceased was buried head to the west. Reconstruction of the original position of the deceased was impossible. By the north-west border of the burial pit a temple ring (1) was found. The arrangement of temple ring was disturbed to a degree that rendered even the approximate reconstruction of its original position impossible.

Anthropological analysis. Female, *Adultus/Maturus*. Pathological changes and injuries: caries of upper, left M2, lower, left P2; enamel hypoplasia of M2, lower premolars and incisors; plaque of molars.

Artefacts recorded in a grave.

1. Silver temple ring, type IIIc acc. to K. Musianowicz. Size: inner diam. – 7x8 mm, outer diam. – 15x16 mm, thickness – 4 mm. Cat. No. 3/2006.

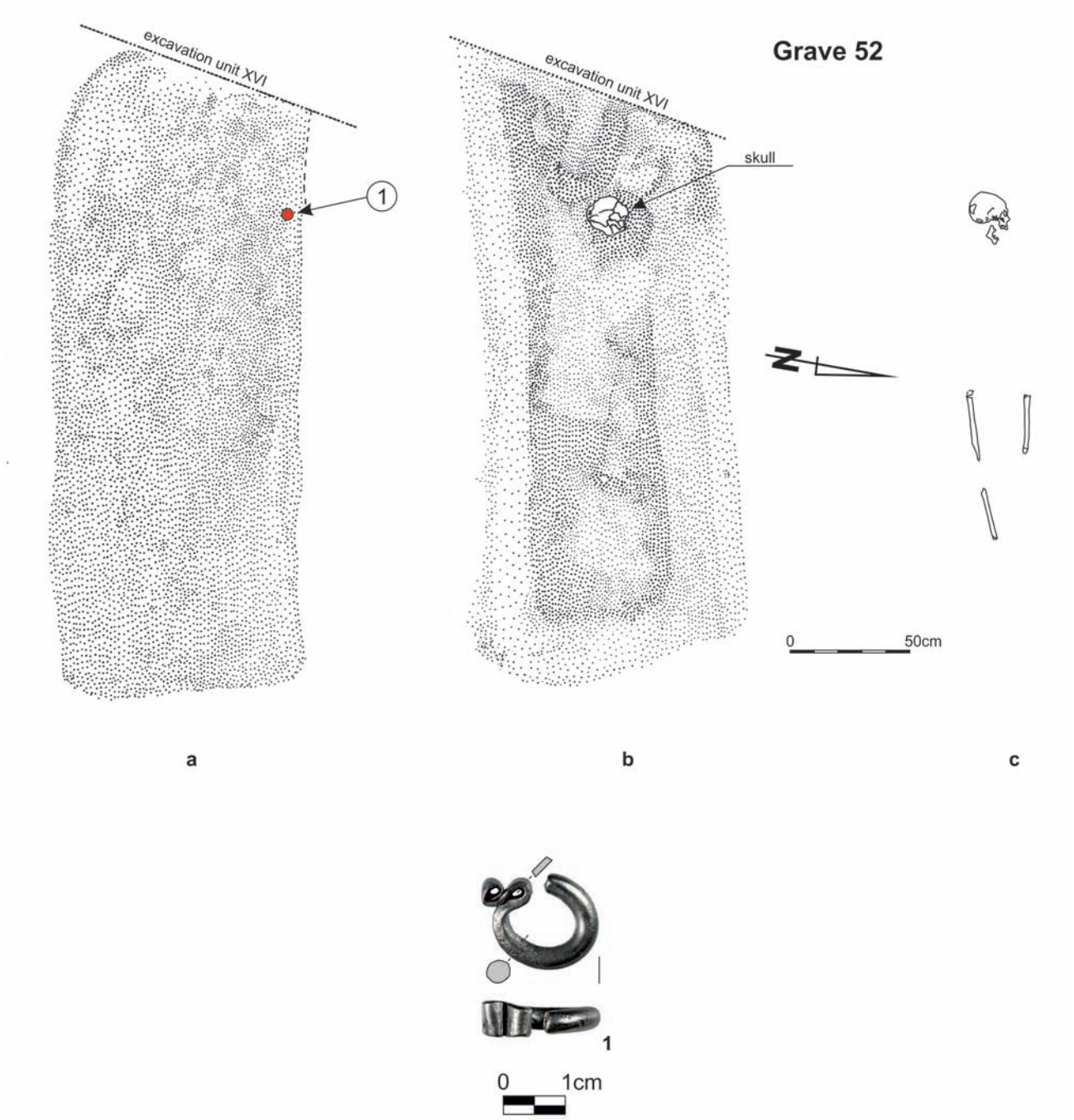

Fig. 31. Grodowice, site 1. Grave 52: a – plan of a burial pit at a depth of 90 cm, b – plan of a burial pit at a depth of 110 cm, c – skeleton's figure; 1 – silver. Photo: W. Pohorecki

Grave 58 (fig. 27) – at a depth of 55 cm from the present day ground surface a burial pit approximately oval in plan, oriented along an east-west axis, and size 142x78 cm was found. The outlines of the burial pit were partially irregular. While exploring the burial pit it turned out to be oval with more regular outlines and size (134x66 cm). The burial pit was dug into the natural loess. The bottom was flat and was recorded at 80 cm. The fill of the burial pit was homogenous with dark-brown humus. At a depth of 55-80 cm well-preserved human bones were found. The deceased was buried head to the west, in a supine position with hands stretched along the corpse. No artefacts were found.

Anthropological analysis. Undetermined sex, *Infans I/Infans II*. Pathological changes and injuries: –

Artefacts recorded in a grave. –

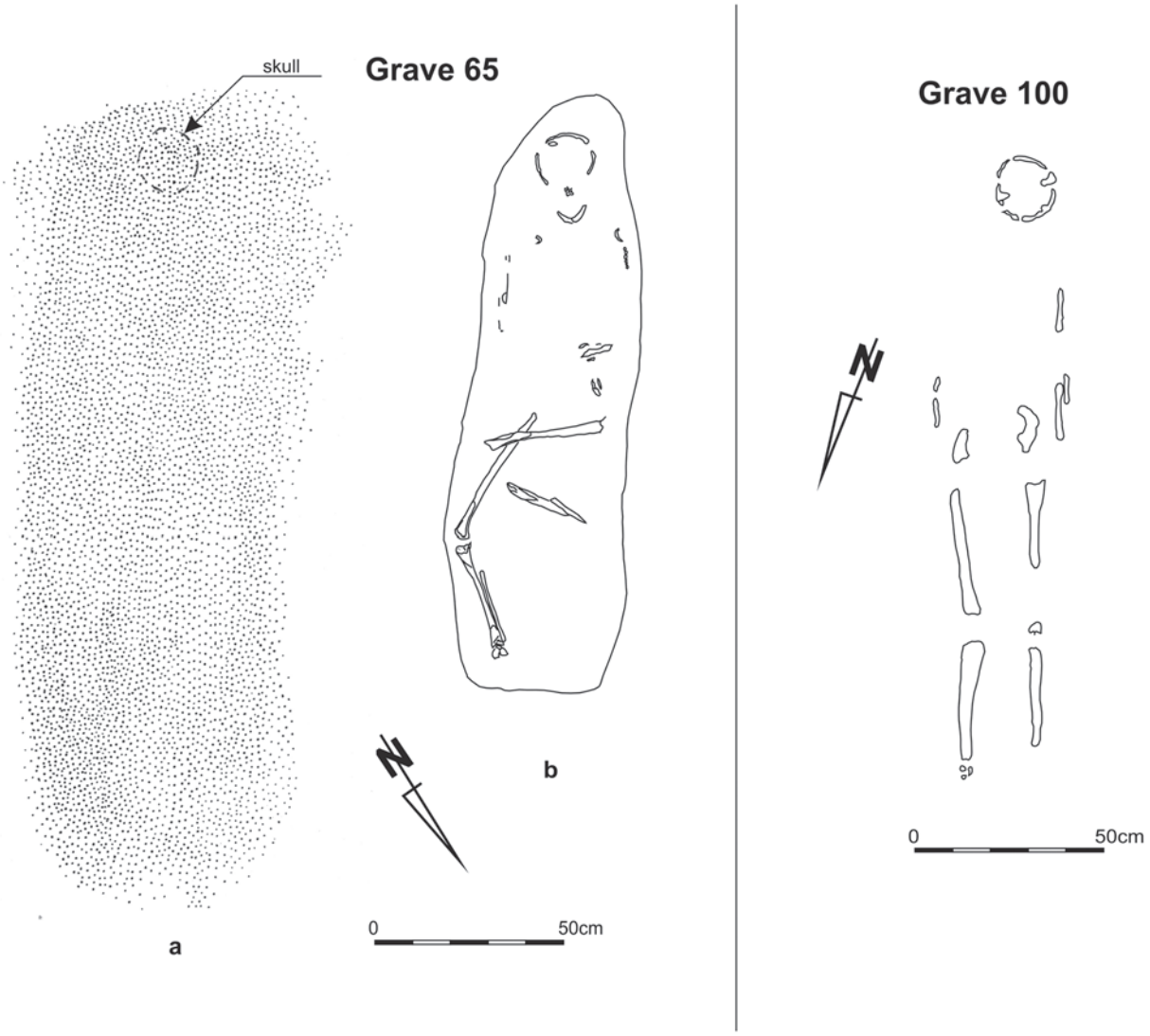

Fig. 32. Grodowice, site 1. Grave 65: a – plan of a burial pit at a depth of 40 cm, b – skeleton's figure with an outline of a burial pit observed during exploration. Grave 100: skeleton's figure

Grave 59 (fig. 27) – at a depth of 70 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 146x72 cm was found. The outlines of the burial pit were irregular due to activity of burrowing animals. While exploring the outlines of burial pit hasn't changed but its plan was regular. The burial pit was dug into the natural loess destroying from the east part feature 28 and 29. The bottom was flat and was recorded at 85 cm. The fill of the burial pit was homogenous with grey-brown humus. At a depth of 70-85 cm well-preserved human bones were found. The deceased was buried head to the west, in a supine position with hands stretched presumably along the corpse. No artefacts were found.

Anthropological analysis. Undetermined sex, *Infans II*. Pathological changes and injuries: –

Artefacts recorded in a grave. –

Grave 65 (fig. 32) – at a depth of 40 cm from the present day ground surface a burial pit rectangular in plan, oriented along an north-east-south-west axis, and size 186x80 cm was found. While exploring it turned out that the outlines of burial pit were irregular and was narrower in the south part. The burial pit was dug into the natural loess. The bottom was flat and was recorded at 65 cm. The outlines of the burial pit were discernible. The fill of the burial pit was homogenous with dark-brown humus. At a depth of 40-65 cm poorly preserved human bones were found. The deceased was buried

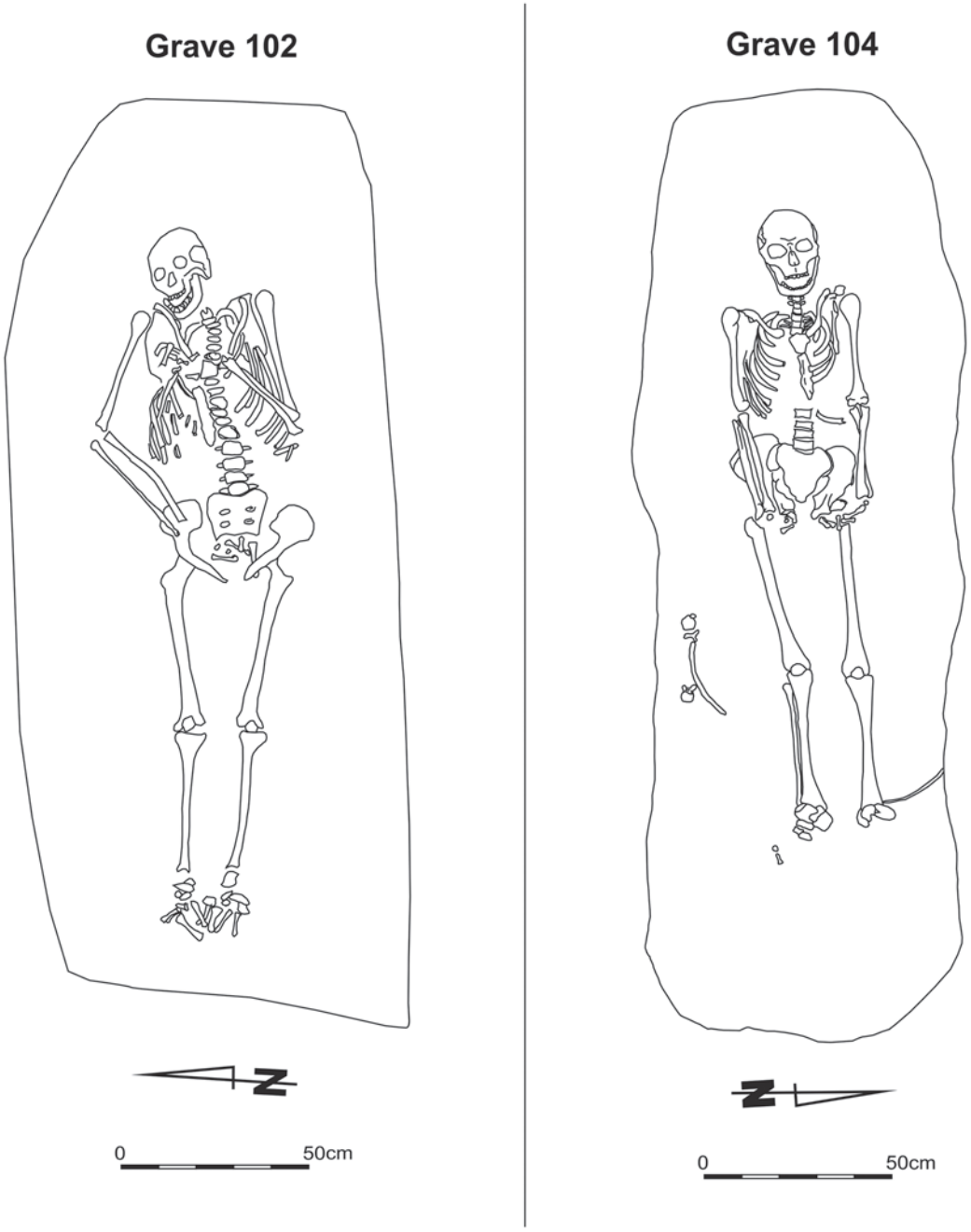

Fig. 33. Grodowice, site. 1. Grave 102 and 104: skeletons' figures with an outlines of a burial pits observed during exploration

head to the south-west, presumably in a supine position. No artefacts were found.

Anthropological analysis. Undetermined sex, *Adultus/Maturus*. Pathological changes and injuries: –

Artefacts recorded in a grave. –

Grave 75 (fig. 27) – at a depth of 50 cm from the present day ground surface poorly preserved human bones (fragmented skull, few fragments of ribs and long bones) were found. Human bones were discovered within the fill of feature 76. The outlines of the burial pit were indiscernible. The deceased was presumably buried along a north-west axis. No artefacts were found.

Anthropological analysis. Undetermined sex, *Infans I*. Pathological changes and injuries: enamel hypoplasia of all deciduous teeth.

Artefacts recorded in a grave. –

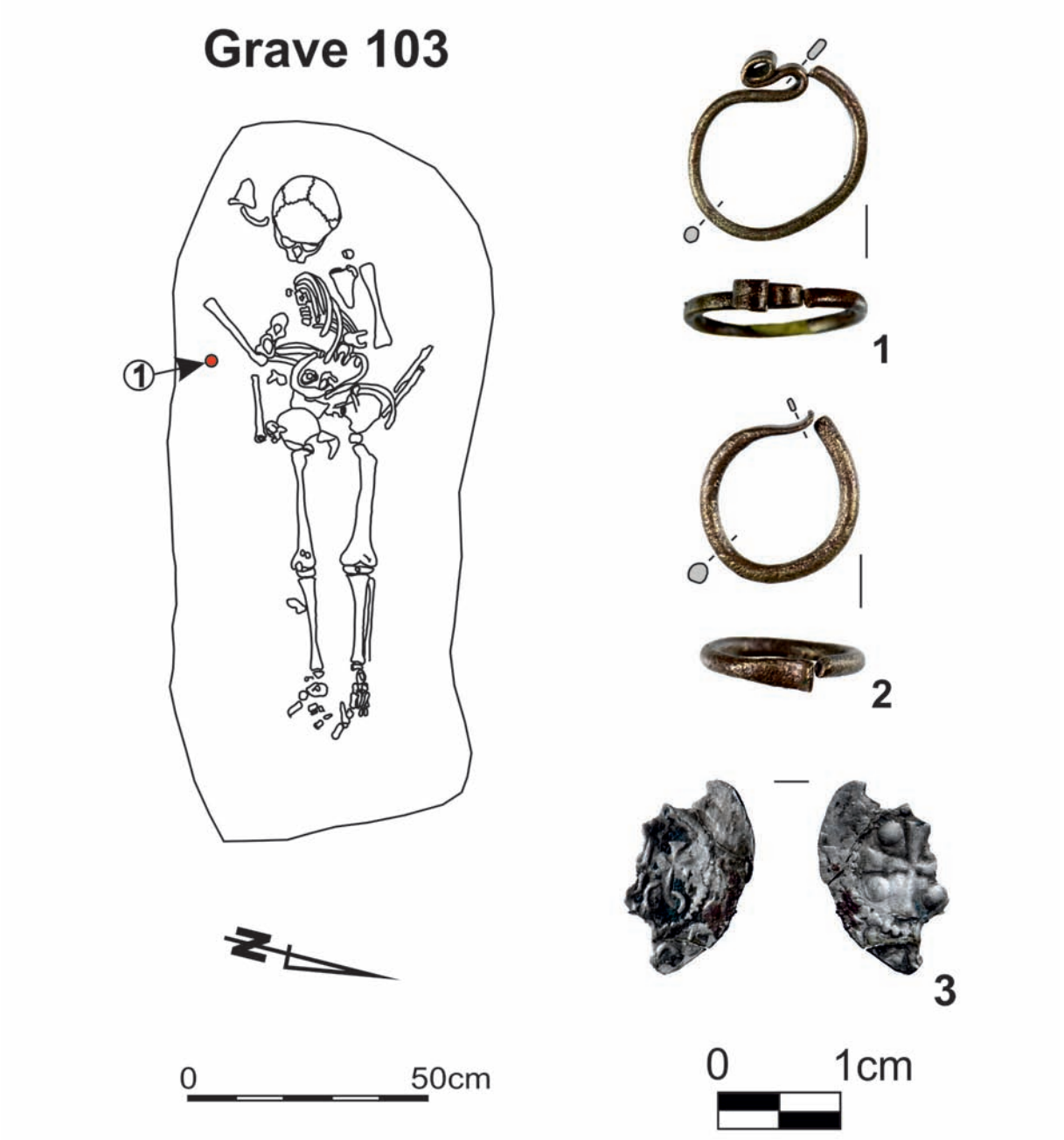

Fig. 34. Grodowice, site 1. Grave 103: skeleton's figure with an outline of a burial pit observed during exploration; 1, 2 – brass, 3 – silver. Photo: W. Pohorecki

Grave 100 (fig. 32) – at a depth of 30-35 cm from the present day ground surface in the top part of feature 101 very poorly preserved human bones were found. The outlines of the burial pit were indiscernible. The deceased was buried along a north-west axis, head to the south. No artefacts were found.

Anthropological analysis. Male, Adult. Pathological changes and injuries: –

Artefacts recorded in a grave. –

Grave 102 (fig. 33) – at a depth of 30 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 262x110 cm was found. The burial pit was dug into the natural loess destroying an older feature 76. The outlines of the burial pit were discernible, in the east part partly adjoined a feature 76. The bottom was flat and was recorded at 85 cm. The fill of the burial pit was homogenous with light-brown humus. At a depth of 75-85 cm

very well-preserved human bones were found. The deceased was buried head to the east, in a supine position with right hand on the pelvis and left hand bent at the elbow and laid on his chest. No artefacts were found.

Anthropological analysis. Male, *Maturus*. Pathological changes and injuries: Schmorl's nodes of thoracic and lumbar vertebrae; degenerative changes of phalanges of metacarpus; caries of M1 (both maxilla and jaw) and premolars; plaque of all teeth in varying degree.

Artefacts recorded in a grave. –

Grave 103 (fig. 34) – at a depth of 30 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 148x68 cm was found. The burial pit was dug into the natural loess. The outlines of the burial pit were discernible. The bottom was flat and was recorded at 45 cm. The fill of the burial pit was non-homogenous with dark-brown humus mixed with lumps of loess. At a depth of 40-45 cm well-preserved human bones were found. The deceased was buried head to the west, in a supine position with hands presumably stretched along the corpse. Two temple rings were found. One of them (1) was found near the right hand, by the south-west outline of the burial pit, at a depth of 45 cm. Arrangement of the second temple ring (2) as well as coin fragment (3) was disturbed to a degree that rendered even the approximate reconstruction of their original position impossible.

Anthropological analysis. Undetermined sex, *Infans I/Infans II* (approx. 7,5 year-old). Pathological changes and injuries: –

Artefacts recorded in a grave.

1. Brass temple ring, type III acc. to K. Musianowicz. Size: inner diam. – ca. 10 mm, outer diam. – 13 mm, thickness – 1.7 mm. Cat. No. 17/2008.

2. Brass temple ring, type III acc. to K. Musianowicz. Size: inner diam. – ca. 10x12 mm, outer diam. – 14x12 mm, thickness – 1.5-2 mm. Cat. No. 19/2008.

3. Silver coin fragment; avers covered with layer of corrosion's products. Numismatic description: presumably a German denarius of Bishop Bernold, issued in the years 1046-1054 AD. Size of a preserved fragment – 9x16 mm. Cat. No. 18/2008.

Grave 104 (fig. 33) – at a depth of 30 cm from the present day ground surface a burial pit rectangular in plan, with rounded corners, oriented along an east-west axis, and size 268x92 cm was found. The burial pit was dug into the natural loess, destroying from the south-west part feature 33 . The outlines of the burial pit were discernible. The bottom was flat and was recorded at 40 cm. The fill of the burial pit was homogenous with dark-brown humus. At a depth of 30-40 cm very well-preserved human bones were found. The deceased was buried head to the west, in a supine position with right hand on the pelvis and left hand stretched along the corpse. No artefact were found.

Anthropological analysis. Male, *Maturus*. Pathological changes and injuries: caries of all molars, especially pronounced on M1; plaque, osteophytes on L3, Th9 and Th10.

Artefacts recorded in a grave. –

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